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THE

PROCEEDINGS

OF THE

LINNEAN SOCIETY

OF

NEW SOUTH WALES,

VOL. V.,

[WITH EIGHTEEN PLATES.]

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PROCEEDINGS

OF THE

LINNEAN SOCIETY,

OF NEW SOUTH WALES.

WEDNESDAY, JANUARY 28TH, 1880.

The President, the Rev. J. E. Tenison-Woods, F.G.S., F.L.S., &c., in the Chair.

MEMBER ELECTED.

Percival Pedley, Esq., Hunter's Hill.

DONATIONS.

Memoires de la Societe Nationale des Sciences Naturelles Cherbourg, 1878; from the Society.

From Dr. Bancroft, Brisbane. (1.) Diseases in Plants and Animals. (2.) Microscope in our Garden. (3.) *Pituri* and Tobacco.

From the President, a paper on a New Species of *Millepora.*

PAPERS READ.

MEDICINAL PLANTS OF QUEENSLAND.

BY F. M. BAILEY, F.L.S., COR. MEM. R.S. TAS., &c., &c.

Some time since I wrote a series of papers on the Medicinal Plants of Queensland, which appeared in one of the country papers of the colony. As the articles were addressed to the general public, they were necessarily stripped of all technical details, and much information of a scientific character was thereby sacrificed. Since then, I have been enabled to extend my observations in this subject and think it may not be unworthy of a place in the proceedings of the Society, if I record all the information I now possess. The utility of the subject will not be questioned, and what is here given may serve to promote investigation in this most practical part of the science of botany.

Looking at our Queensland Flora one is struck with the great number of species, which are either identical with, or closely related to those in other parts of the world, particularly India, where a great many have been used in the healing art with more or less success, as may be seen by reference to works on the subject. I shall therefore go through Bentham and Muéller's excellent work, the "Flora Australiensis," and note all plants of our indigenous or naturalized flora that are mentioned in such works as Dr. Lindley's "Flora Medica" giving the properties for which they are noted. It might also be well to direct attention to a few plants, which probably contain medicinal qualities. Thus in the Northern scrubs, several species of *Tetracera*, a genus of *Dilleniaceæ*, are found climbing to the tops of the timber trees. The Queensland species of this plant are all endemic and untried, but the Brazilian species are used in the curing of certain complaints. *Brasenia peltata*, Pursh., of *Nymphæaceæ*, a curious water lily, which may be seen on a few of the ponds of still water near Brisbane, will be easily recognised by the mucilaginous substance which covers the young shoots, and its oval peltate floating leaves. In America it is considered nutritious, probably from the large-grained starch it contains. The leaves are astringent, and have been employed in phthisis and dysentery.

Our beautiful pink water lily, *Nelumbium speciosum*, Willd. is not without medicinal qualities, for we are told by Endlicher, that the milky viscid juice of the flower-stalks and leaf-stalks is a remedy in India against sickness and diarrhœa. The petals of the flower are also stated to be astringent. The rootstock and seed are used as food in China, India, and also in Australia.

Argemone mexicana, Tournefort. A plant of the Poppy family, with thistle-like leaves and bright yellow flowers, now naturalised in many parts of Queensland, is according to Dr. Lindley's "Flora Medica," called by the Spaniards "Figo del inferno," on account of the powerful narcotic effects of its seeds, which are stronger than opium. An emulsion prepared from them acts as an anodyne and afterwards as a purgative. This effect is denied by some, by others it is stated that the oil obtained from the seeds is used in Nevis as a substitute for castor oil. In India the juice of the plant is used in chronic ophthalmia, and in primary syphilitic sores. The infusion is said to be diuretic, and to give relief in strangury from blisters.

A tropical weed of the Caper family, *Polanisia viscosa*, DC., common in Northern Queensland, where H. W. Stone, Esq., states it is used by the natives to relieve headache. It is used in Cochin China as a counter irritant in the same way as sinapisms in Europe, and also as a vesicant. In the United States the roots are said to be used as vermifuge. The plant is covered with viscid hairs, leaves of from three to seven leaflets, flowers yellow, in terminal racemes, capsule long linear, containing numerous wrinkled seeds.

Ionidium suffruticosum, Giug., a plant of the order *Violaceæ*, from one to two feet in height, having alternate, linear leaves, bearing axillary filiform peduncles with a single small flower, all the petals of which are minute except the lowest, which is often lengthened to near half-an inch; seeds beautifully marked with longitudinal striæ. This species is common throughout Queensland also in Tropical Africa and Asia. In India the roots are used medicinally in diseases of the urinary organs, the leaves as an external application. Doubtless the other six species found in Australia would be equally efficacious.

Of *Cochlospermum* a genus of *Bixineæ* there are five species in Australia one of which is considered by Mr. Bentham likely to prove identical with the East Indian *C. gossypium* from the stems of which is obtained a gum, called kuteera, which is used as a substitute for gum tragacanth, because of its viscidity. A decoction of the roots of some of the Brazilian species is used against internal pains, particularly those resulting from falls. In the same parts, a decoction is said to cure abscesses. From the roots of an African species a yellow dye is obtained, which is called Fayar, used for dying cotton stuffs as well as in medicine in cases of amenorrhœa. From the above one we might fairly imagine our species to possess some medicinal virtues. The greatly admired shade tree of the beach at Cardwell, belonging to *Guttiferæ* now well known by its botanical name of *Calophyllum inophyllum*, Linn., besides its value as a shade tree in the tropics exudes from its trunk a greenish coloured resin called East Indian Tacamahac. The seeds also yield a thick, dark-green, strong-scented oil, employed in India for burning and also medicinally. In India an oil is expressed from the seeds of *C. tomentosum*, a tree according to Baron Muéller's "Fragmenta Phytographiæ Australia," also met with in the ranges about Rockingham Bay.

The three following Malvaceous plants have been found useful medicinally—*Sida cordifolia*, Linn. A coarse under shrub, more or less clothed with velvety, often star-shaped hairs, and somewhat heart-shaped leaves borne on rather long stalks at the base of which it produces its small yellow flowers. This plant, like our common Sida weed, to which it is closely allied, is met with in most tropical countries. In India the leaves are mixed with rice, and given to alleviate dysentery. The Queensland habitat is Peak Downs, &c. It may not be generally known that the ripe carpels of *Sida rhombifolia*, Linn., the common Sida weed of Queensland often cause the death of fowls that feed on them, by the sharp terminal arms of the carpels irritating the inside and causing inflammation. Roots used in India as a remedy for rheumatism.

Abutilon indicum, G. Don. A tall shrub with roundish toothed leaves, softly downy, flowers yellow, capsule hairy, widely spread in tropical Australia, Asia, and Africa, is used in India as the mallow is in Europe, as an emolient.

Urena lobata, Linn. A tall handsome shrub, with velvety roundish obtusely-lobed leaves, and pinkish axillary flowers, succeeded by carpels covered with hooked bristles. This shrub, which belongs to the tropics of both the new and old worlds, is commonly seen in Northern Queensland, and may be also met with in some of the gullies of Taylor's Range, near Brisbane. In Brazil a decoction of the root and stem is used as a remedy for the windy colic, and the flowers as an expectorant in dry and inveterate coughs.

Carapa moluccensis, Lam. A small tree with pinnate leaves of two to six opposite leaflets of a coriaceous texture. It is found on our tropical coast and is of crooked growth. The tree which belongs to *Meliaceæ* is conspicuous from its large round shaddock like fruit, which contain four to six large irregular-shaped seeds. It is said to possess an extremely bitter principle. The seeds of other species yield valuable oils. Our Red Cedar is another Meliaceous tree of value not only for its timber, but for its medicinal qualities. Thus, under its botanical name, *Cedrela Toona*, Roxb., we find the bark spoken of as a powerful astringent and though not bitter, is said to be a good substitute for Peruvian Bark in the cure of remitting and intermitting fevers, particularly when joined with a small portion of the powdered seed of *Guilandina Bonduccella*, Linn., another of our plants which will be noticed in its proper order. In Java, according to Dr. Blume the bark of this cedar is used with great success in the worst epidemic fevers, diarrhœa &c. It has been also used with advantage in dysentery, in the last stage when the inflammatory symptoms have disappeared. Some consider it especially useful in bilious fevers, and inveterate diarrhœa arising from atony of the muscular fibre.

In the Buckthorn family we have two species of *Zizyphus*, which have been found useful in the healing art. *Z. Œnoplia*, Mill, a straggling shrub, bearing sharp prickles and downy three to five nerved leaves, and fruit the size of peas, black, edible. It is said that a decoction of the bark of the fresh root promotes the healing of fresh wounds. *Z. jujuba*, Lam. A small tree, often planted in our gardens for its fruit, is, with the last found about Cape York and on the islands of the Gulf of Carpentaria in a wild state. Both are common in India, and of this last the fruit there is prepared into pectoral lozenges called "Pate de Jujube," and the bark is employed in the Moluccas as a remedy for diarrhœa. The pretty climber *Cardiospermum Halicacabum*, Linn., called in Queensland Balloon climber, in other parts Heartseed, or Heartpea from the heart-shaped scar on the seed. In India the root is considered aperient, diaphoretic and diuretic. The plant will be easily recognised by its climbing habit, twice ternate leaves, and bladder-like capsule, which resembles the calyx, that encloses the fruit of the Cape Gooseberry.

Schmidelia serrata, DC., is a straggling shrub often met with in the swamps of Northern Queensland near the coast. The leaves are of three leaflets and the berries bright red. The roots are astringent and are employed in India, where the plant is common to stop diarrhœa. These two last plants belong to *Sapindaceæ* the Soapwort family.

Leguminosae, one of the largest orders of Phænogams is divided into three sub-orders, all of which are well represented in Australia. The known genera are a little over 400, examples of about a fourth are found in Australia. To this order we are indebted for very many useful and ornamental plants, but after enumerating many of its products Dr. Lindley says:—"There is this, however to be borne in mind, in regarding the qualities of the order in a general point of view, viz., that upon the whole it must be considered poisonous, and that those species which are used for food by man or animals are exceptions to the general rule, the deleterious juices of the order not being in such instances sufficiently concentrated to prove injurious and being in fact replaced to a considerable extent by either sugar or starch." This is verified in the first plant that will be brought into notice, which by taking the tribes of the first sub-order *Papilionaceæ* in their proper order we find is *Gastrolobium grandiflorum*, F.v. Muéll. the Northern Poison Bush. This can scarcely be said to come under the denomination of a medicinal plant, yet the active principle which so sadly destroys stock, in the hands of a medical man could doubtless be made to serve some useful purpose, and it is to be hoped that before long attention will be turned to this and a few other similar dangerous plants, and a careful course of experiments carried out, which would be far better than a mere analysis of the plants by a chemist The plant in question is worthy of a place in the garden from the beauty of its flowers; it grows to a few feet in height; has opposite (or at times a few alternate) leaves, which are usually oblong, obtuse, with a notch at the end, and covered with close silky down. The flowers are produced at the ends of branchlets in short racemes, and in colour resembles the English Wallflower (*Cheiranthus Cheri*, Linn.).

Tephrosia purpurea, Pers., is a small straggling under shrub with pinnate leaves and purple small flowers, the racemes of which are usually opposite the leaves. There are several varieties of this species; the Brisbane form may be seen on the borders of creek scrubs. A decoction of the bitter root is prescribed by Indian doctors in dyspepsia, dysentery and tympanites.

Sesbania grandiflora, Pers. A soft-wooded, rapid growing, small tree of short duration, having long glaucous pinnate leaves of often 20 to 30 oblong leaflets, common in India, found towards our North-western boundary; is said to possess a powerfully bitter tonic bark. The tree is of common occurrence in the gardens around Brisbane; its quick growth, large white flowers, and graceful foliage causing it to be a general favourite.

S. Ægyptiaca, Pers., another species of this genus found around the Gulf of Carpentaria, and also in Asia and Africa, is said by the Hindoos to possess the power of hastening suppuration when applied as a poultice, which is simply made with warmed leaves moistened by a little castor oil. The flowers of this species are yellow and purple, borne in pendulous racemes.

S. aculeata, Pers., is much more generally met with in Australia and although I find no medicinal properties attributed to it, yet probably it would serve the same purposes as the last. It is also similarly wide-spread in other countries; its favourite habitat in Queensland is on the borders of swamps. In Northern Queensland, according to Mr. T. A. Gulliver, the natives make bread of the seeds. I am of opinion that this is the true Nardoo of the Cooper's Creek natives. The unfortunats explorers, Burke and Wills, might easily have mistaken the sporecases of a *Marsilea* for the shelled-out seeds of *Sesbania*. Writing to my friend Mr. Gulliver on the subject, he says:—"I think it quite possible that such a mistake was made by the unfortunate explorers who first brought the "Nardoo" into notice, more especially as I find the natives here (Norman River) do not seem to care about the *Marsilea* seed, and as far as I have seen it does not produce sufficient seed to make it worth collecting; whereas the *Sesbania* is very prolific and can be gathered without any, or rather, with very little trouble. This species has more numerous leaflets than the last, the flowers are also smaller, with erect racemes. The prickles are minute, or altogether wanting.

Hardenbergia monophylla, Benth., (Native Sarsaparilla). The roots of this beautiful purple flowered twiner are used by bushmen as a substitute for the true sarsaparilla, which is obtained from a widely different plant. I cannot vouch for any medicinal properties.

Abrus precatorius, Linn. A dull looking, slightly hairy twining plant with leaves of from seven to ten pair of pinnæ and racemes of dull purple or pink flowers; found rambling over the shrubs of our tropical coast, also in the East and West Indies. In the latter, the roots are used as a substitute for liquorice, and an infusion much used as a diluent drink, may be prepared from them. The seeds of which there are about four in a pod, are of a brilliant scarlet with a black scar, and are used for many ornamental purposes. These seeds at one time were considered poisonous; but on the contrary, it seems that they are sometimes used as an article of food in Egypt.

Sophora tomentosa, Linn.—Sea coast Laburnum. The roots and seeds have been regarded as specifics in bilious sickness. The whole shrub is covered with close silky hairs. Flowers, large yellow, in racemes like the Laburnum or Golden Chain of European gardens.

In the second Sub-order *Caesalpinieæ*, purgative properties abound, and it might be well, considering we have many endemic species of *Cassias*, to look among them for a substitute for the Senna of commerce.

Cassia Absus, Linn. A small viscid plant about one foot high, leaves of two pair of leaflets which are broadly obovate, and from half to one inch long; glands between the leaflets small, stipules narrow. Flowers, usually in short terminal racemes, bracts small reflexed. It is common to tropical Asia and Africa, and is also found on our tropical coast. The seeds are extremely bitter, aromatic and mucilaginous and it is said that they are brought from the interior of Africa to Cairo under the name of Chichin or Cismatau, and are regarded as the best of remedies for Egyptian or purulent Ophthalmia.

Guilandina bonducella, Linn. This is a large rambling shrub, covered with hooked prickles; found along our tropical and other tropical coasts. The leaves are large, twice pinnate; pods short broad, prickly, containing two or three large polished bluish-grey seeds, which are often strung into necklaces, bracelets, rosaries, &c. These seeds have a bitter taste and are employed by Indian doctors as a tonic and febrifuge. The specific name is said to be derived from the Arabic "Bondog," a necklace.

Cæsalpinia nuga, Ait. A plant of similar habit to the last is found on some of the islands off our North-east coast with seeded pods. It is said that the roots are used in decoctions for calculous and nephritic complaints.

The third Sub-order *Mimoseae* includes *Acacia* the most numerous in species of all Australian Phænogamous genera. The bark and gums of many species are used to stop diarrhœa by bushmen. From the flowers of one, *A. farnesiana*, Willd., called "Dead-finish" on the Darling Downs, a delicious perfume is distilled. This species is common to the warmer regions of the new and old world.

According to Dr. Wm. Woolls' "Contributions to the Flora of Australia," page 97, one of our *Rosaceous* plants, *Rubus parviflorus* Linn., has been found to possess some valuable medicinal properties, but what those properties are is not stated.

Although the order *Myrtaceæ* to which we are now come furnishes us with much valuable timber, it contains but few species from which medicinal drugs were obtained by Medical men of the old school. Of late attention has been turned to our *Eucalypts*, and from some valuable medicines have been obtained. An essence, with all the fragrance of the best Lisbon lemons was obtained some time back by K. T. Staiger, Esq., the Government analytical chemist, from the foliage of a species found on the Palmer River of which no flower specimens have as yet been sent down, therefore its affinity cannot be determined and it remains botanically unknown. From another species *E. citriodora*, Hooker, the same gentleman has also obtained an essence which partakes of the flavour of the citron. This latter tree is plentiful at Rockhampton.

A plant of the typical genus of *Melastomaceæ*, *Melastoma malabathricum*, Linn., is very attractive in most Queensland swamps from the profusion of its large open purple flowers and prominently three to five nerved leaves. Is recommended in cases of diarrhœa and dysentery; the leaves are the part used. The succulent fruit is edible, but dyes the mouth black, hence the generic name.

Ammannia Indica, Lan. A plant of *Lythrarieæ*, found usually on swampy land, is erect in growth with oblong or linear leaves and flowers in small axillary clusters. Queensland habitat, Endeavour River and about Cooper's Creek. The whole plant has a strong aromatic smell, leaves acrid, and commonly used by the natives of India to raise blisters in rheumatic pains, fevers, &c. The fresh leaves bruised perform their office effectually in half an hour. To this same order belongs *Lythrum Salicaria*, Linn. The common purple Loosestrife of Britain enlivens with its beautiful purple flowers many of our swamps. The whole plant is astringent, and has been recommended in inveterate cases of diarrhœa. It has also been used in tanning.

In *Cucurbitaceæ* the order to which the Cucumber and Melon belong, we have a few species which have been used in the healing of various disorders. Thus *Trichosanthes palmata*, Roxb., in India where the plant is also indigenous, the fruit is pounded and intimately blended with warm cocoa-nut oil, and considered a valuable application for cleansing and healing the offensive sores that sometimes form inside the ears. It is also supposed to be a useful remedy poured up the nostrils in cases of ozæna. As in India, so in Queensland, this plant climbs to the top of our scrub trees. The flowers are large, white, and beautifully fringed.

The bottle-gourd, *Lagenaria vulgaris*, Seringe., so plentiful along our tropical coast, is said to be a dangerous poison. It is said that some sailors were killed by drinking beer that had been standing for some time in a bottle formed of one of these fruits.

Momordica balsamina, Linn. The Balsam Apple, common in gardens, out of which it has strayed into some of our northern scrubs; has been said to be a dangerous poison, but in small doses a hydragogue.

In the large order *Compositæ*, of which the Australian genera is about 100, few species have been examined for medicinal qualities. Baron von Mueller, the learned botanist of Victoria, prepared a snuff from one of the forms of *Myriogyne minuta*, Less. one of our most common weeds some years back.

Eclipta alba, Hassk. The erect form so common near water about the Brisbane River, &c., is said to be used by the Brazilian women to stain their hair black.

The rank growing Burweed, *Xanthium strumarium*, a plant allied to the Bathurst Burr and now rapidly spreading over the country is supposed to be very injurious to Stock, numbers having died from feeding on the young succulent plants. Dr. Bancroft is at present making experiments with a view to seeing if the active principles contained in the plant cannot be put to some useful purpose. This plant differs greatly from the Bathurst Burr or *Xanthium spinosum*, L. Its leaves resemble more the mallow and it is destitute of prickles, except on its fruit.

Our indigenous Leadwort, *Plumbago zeylanica*, Linn., which is identical with the garden plant *P. capensis*, is said to act as a vesicatory, the fresh bruised bark of the root being used.

The pretty Pimpernel, *Anagallis arvensis*, Linn., one of the few plants in our pasture belonging to *Primulaceæ*, is said to possess very powerful properties. Three drachms of the extract of this plant have been found enough to kill a dog; it was found to have inflamed the mucous membrane of the stomach. It has been prescribed in epilepsy and dropsy. *Samolus Valerandi*, Linn. A plant of the same order, found often near shallow running water; is said to possess a bitter principle.

Cerbera Odallam, Gœrtn. A tree belonging to *Apocyneæ* found on our tropical coast, and not uncommonly planted in our gardens where it flowers as a shrub. Of this the seeds are said to be poisonous, but the milky sap has been used as a purgative and in Java the leaves and bark as a substitute for senna.

Alstonia, another genus of Dogbanes of which there are several species in Queensland—one *A. constricta*, F. v M., produces a tonic now much used, and *A. scholaris*, R. Br., grows to a tree of large size, the timber of which is said to be bitter as gentian. In chronic diarrhœa and the advanced stages of dysentery, it has proved valuable. It has also been found effectual in restoring the tone of the stomach, and of the system generally, in debility after fevers and other exhausting diseases. This is one of several trees called white-wood about the Herbert River.

In the closely allied order *Asclepiadeæ* the Red-head *Asclepiadeæ curassavica*, Lem., a plant of tropical America, now fast spreading over the colony; is used in the West Indies as an emetic, and called Wild Ipecacuanha; the root which is the part used, is also purgative; a decoction is recommended in gleets and fluor albus.

We have in Queensland two species of *Strychnos*, a genus of *Loganiaceæ*—one a rambling shrub with fruit of one inch or more in diameter, somewhat orange colored, met with on the Walsh Range. This is Robert Brown's *S. lucida* which is thought closely allied to the well-known *S. nux-vomica*, Linn. The other has much larger leaves and smaller fruit, and of almost climbing habit. This species is Baron Muéller's *S. psilosperma*, a form of which is plentiful in the scrubs around Rockhampton. It is to be hoped that before long the fruit of these two plants will be tested for medicinal properties.

Although some of our Gentianworts have a wide range in other countries, none seem to have enjoyed any reputation as medicinal plants, but in New South Wales two of this family seem to be used, for Dr. Woolls, in "Contributions to Flora of Australia," page 97, says :—"Two little plants of the Gentian Family common enough in spring, the one with pink, the other with yellow flowers. (*Erythræa Australis*, R. Br., and *Sebæa ovata*, R. Br.) are great favourites with those persons who know the value of them, and they have proved highly efficacious in certain stages of dysentery. The pink one is generally called Centaury, and is the more powerful and like the allied European species possesses all the essential properties of the gentian of the shops, and although not used professionally is a very valuable native medicine; in places where it grows it is carefully collected for use in rustic pharmacy." A learned physician not a hundred miles from Parramatta was so impressed with the efficacy of this little herb from noticing the use of it amongst certain old women in his neighbourhood, that he was not too proud to adopt their remedy and recommended it to his patients. The first of these is very plentiful throughout Queensland, but the latter has only been found in one locality, (near Warwick) by Dr. Prentice.

Hydrolea zeylanica, Vahl. A creeping herb of *Hydrophyllaceæ;* found about the Gulf of Carpentaria also in the East Indies and America. According to Wight, the leaves beaten into pulp and applied as a poultice, are in India considered efficacious in cleansing and healing ill conditional ulcers, particularly those in which maggots have begun to breed. Leaves short, lanceolate two inches long, smooth; flowers dark blue in a terminal panicle.

Cordia myxa, Linn. A handsome tree of Northern Queensland belonging to the tribe *Cordicæ* of *Boragineæ*. The species is also dispersed over tropical Asia, from Ceylon to the Philippines. The large fruited *C. latifolia*, Roxb., is a form of this species with larger leaves and fruit. The Sebestens of the European Matera Medica is the fruit of this tree. The bark is a mild tonic, and used in India for astringent gargles; and in Java as the chief remedy in fevers; the roots are thought laxative. The Egyptian mummy cases were made of this timber, which is soft, and supposed the best for kindling fire by friction.

In this same tribe is also found the rather coarse herb *Trichodesma zeylanica*, R. Br., an Indian plant common in many parts of Queensland. In India this with other species, is considered diuretic, and one of the cures for the bites of snakes. Baron Mueller recommends the plant as a fodder herb, saying that the dromedaries of Mr. Giles' Exploring Party were found to be particularly partial to it.

In the beautiful order of Bindweeds, *Convolvulaceæ*, we find some of our indigenous species are still favourably spoken of as Medicinal plants in other parts of the globe where they are also met with. The roots of the order usually abound in an acrid, milky juice, which is purgative, as for instance, the common purge Jalap, and the stimulating cathartic Scammony. This purgative property is said to depend upon a peculiar resin, but with some this purgative resin is replaced by sugar or starch, and the roots then become valuable articles of food, as in the sweet potato. The first species to notice is *Ipomæa paniculata*, R. Br., a large smooth twining plant with palmately divided leaves, and showy purplish flowers; found on most tropical coasts. The thick fleshy roots of this species are said by Baron Mueller, "Select Plants," to be edible and deserving of cultivation as a food plant. But in other works the roots are said to be cathartic and used as such in many places where the plant grows. The Queensland habitat is from Rockingham Bay to Cape York. In another of our native plants of this genus *Ipomæa hederacea*, Jacq. the purgative qualities are in the seeds. The seeds are sold in the apothecaries' shops of India under the name of "Kala dana" (Black Seed), and are said to be a quick and effectual cathartic. The seeds are roasted like coffee, powdered, and administered in doses of from 30 to 40 grains, in any convenient vehicle. This plant, which is one of the most beautiful of the genus, is met with in the tropics everywhere. The leaves are usually three-lobed, and the flower a most delicate light blue; large plants may be seen in some of the gardens about Brisbane.

Ipomœa Turpethum, R. Br. Another large climbing species of our tropical coast, and also of India. It is said that the fresh bark rubbed up with milk is used in India as a purgative. About six inches in length of the root as thick as the little finger is reckoned a dose.

Ipomœa pes-caprae, Roth. The species so commonly seen trailing over the sandy beach from the Richmond River to Cape York, with leaves on long petioles, broadly emarginate, the veins of which are parallel. Peduncles long as leaves, bearing one or two large pink flowers. It is used in Brazil to form a poultice made with the boiled foliage in cases of scrofulous enlargement of the joints.

The common *Solanaceous* weed *Solanum nigrum*, Linn., the small black fruit of which is at times eaten freely by children under the name of black currants without any ill effects, although at other times it has caused dangerous sickness; is a narcotic; the extract is said to possess the same power as lettuce opium. The leaves have been used with advantage in dropsical affections. Its action is diuretic and laxative.

Another plant of *Solaneae*, the Thornapple, *Datura stramonium* Sim., which may be seen spreading over the colony, is a most useful medicinal plant. It is a violent narcotic poison when taken internally, acting fatally if taken in large doses, but a valuable medicine in mania, epilepsy, convulsions, tic doloureux &c. It palliates the distressing paroxysms of pure spasmodic asthma when smoked, for which purpose the leaves are used. It is also employed successfully as an external application, as an anodyne and sedative in burns, hæmorrhoids, irritable ulcers &c. It would be well if some person living in the parts where our endemic species *D. Leichhardtii*, F. v. M., grows were to forward a quantity down to Dr. Bancroft, who has spent so much time in testing the properties of our native plants that he might see what its properties were. This species is said to be common on the Gilbert, Comet, and Suttor Rivers.

There are two of our indigenous plants of this order that will doubtless before long be in great request. First, *Duboisia myoporoides*, R. Br. So far back as 1861 we find Rev. William Woolls, F.L.S., drawing attention to this tree, stating that it was used by the aborigines on account of its toxicant properties; he says "they make holes in the trunk and put some fluid in them, which when drunk on the following morning produces stupor also that branches of this tree are thrown into pools for the purpose of intoxicating the eels and bringing them to the surface." Dr. Bancroft has found that an extract from the leaves dilates the pupil of the eye better than Belladonna, and in an article in the Lancet, Feb., 15th, 1879, by Professor Sœlberg Wells, F.R.C.S., on the use of Dr. Bancroft's *Duboisia* he says:—"A four grain solution of duboisin produces a much more rapid dilation of the pupil and powerful action on the muscle of accommodation than a solution of atrophine of the same strength. The pupil in a normal eye becomes dilated ad. maximum in ten to twenty minutes, the accommodation (if there is no spasm of the muscle) paralysed in twenty to forty minutes this lasting for three or four days." The other *D. Hopwoodii*, F. v. M., furnishes the natives of our Western Districts with their strong narcotic, called Pituri. While the European genera of *Scrophularineæ* contains many valuable medicinal herbs, the Australian genera seems to be of little importance in medicine although a few are used as *Herpestis monnieria*, H. B. and K., a small trailing plant with rather thick fleshy, oblong leaves and white flowers. In India the expressed juice of the leaves mixed with Petroleum is used for rubbing parts affected with rheumatic pains. Another little shrubby plant, bearing small white flowers, and leaves in whorls of three, called *Scoparia dulcis*, L., is met with from Rockhampton northward. Of this plant an infusion is used by the Indians in Spanish America to cure agues. In Brazil the expressed juice which is mucilaginous is employed as a cooling drink. Perhaps if properly examined our common swamp herb—*Gratiola* *pedunculata*, R. Br., would be found to possess medicinal properties. One of the genus in former times in Europe was called Gratia Dei, on account of its medicinal properties, which are said to be bitter, purgative and emetic—poisonous in large doses. The European species if abundant in the pasture, is said to be dangerous to cattle.

Attention may be drawn to a small shrub of *Myoporineæ* called *Eremophila maculata*, F. v. M., or Native Fuchsia, which is regarded as a poison bush by some graziers, although others consider it quite harmless and with others of the genus, good fodder bushes. The plant bears a profusion of handsome red and yellow flowers, which should recommend it for garden culture and as there seems a doubt of its properties it would be well to have it examined for medicinal purposes. The shrub is abundant throughout the Warrego and Barcoo.

Vitex trifolia, Linn. A shrub of *Verbenaceæ*, having mealy-white leaves of from three to five leaflets and terminal panicles of pale blue flowers. Very common along our coast, and at one time on the Brisbane River. In India where it is common the small round acrid fruit is called "filfil burree" or wild pepper. The leaves are said to be a powerful discutient and are employed by the Malays to remove the boss. In other places the leaves are given in decoction and infusion and form a cataplasm which is applied to the enlarged spleen. To this order also belongs the White Mangrove, *Avicennia officinalis*, Linn., a tree widely spread over the warmer maritime regions of the new and old world. The flowers of this tree are not very conspicuous, being of a greenish yellow colour; but the fruit which begins to germinate before it falls, may be seen in great abundance along the water's edge, and has somewhat the appearance of sprouting broad-beans. The bark is used at Rio Janeiro for tanning. The unripe seeds are used in India as poultices, and when ripe boiled and eaten by the poor.

Few of our *Labiates* have been tried for medicinal purposes, yet many if examined would most likely be found to possess, if not medicine, valuable fragrant oils for other purposes. Baron von Muéller says that several of our mints yield oil of good flavour and among them our common Pennyroyal, *Mentha satureioides*, R. Br.

Valuable properties are ascribed by both native and European doctors in India to various species of *Ocymum*. *O. sanctum*, Linn. the leaves of which in a dried and pulverised state are used by the Bengal natives as snuff in the endemic affections of the nasal cavities and are termed Peenash, is said to be an effectual means of dislodging the larvæ of flies from wounds. The Australian plant is a narrow-leaved form of this species, and has a delightful fragrance resembling anise, hence Baron von Mueller's name, *O. anisodorum*.

The common horehound, *Marrubium vulgare*, Linn., which has become naturalized in many parts of the colony, is thought by some to be beneficial to sheep. An extract of this herb is a popular remedy for coughs and asthmatic complaints; it is also recommended in chlorosis and hysteria as stimulating and tonic. The plant was once used in many diseases but scarcely at all now except as a domestic remedy for chest complaints. An erect herb of this order, plentiful in the Toowoomba and other swamps. *Lycopus Australis*, R. Br, being nearly related to the English Water Horehound, from which a black dye is obtained, it might be well to try for a similar property.

The *Chenopodiaceæ* are chiefly of importance to us as containing the highly esteemed fodder called salt bushes; but from the genera *Salsola* and *Salicornia*, both salt marsh plants, large quantities of soda might be obtained.

In *Amarantaceæ* the order to which our garden Cock's-comb belongs, we find many of our most troublesome weeds and one of these, *Amarantus viridis*, Sim., is not without its use for besides a fair substitute for cabbage the leaves have been employed externally with advantage as an emollient poultice. Another weed of this order found very plentifully about Ipswich, called *Achyranthes aspera*, Linn., easily known by its rigid erect spike of spring-fruit, which are pointed downwards on the stalk, is said to have been found useful in India in dropsical cases. According to the Pharmacopœia of India the whole plant when incinerated, yields a considerable quantity of potash, hence its sanscrit name Ap-amarga, *i.e.* the washerman, from the circumstance of the ashes being used in washing clothes. The bitter and acrid leaves of *Deeringia celosioides*, R. Br., are used against the measles in Java. This large woody straggling plant of our scrubs can be easily recognised when in fruit by its bright red currant-like berries.

The majority of the plants belonging to the Order *Polygonaceæ* or Buck-wheats, are mere weeds, but still we are indebted to it for some valuable products, for here we find the Buckwheat, Rhubarb, &c. From one plant of the order a blue dye equal to indigo is obtained. Various species of *Rumex* (Dock) whose prevailing character is astringency, have been used as remedies in cases of diarrhœa and dysentery for which our own kinds might prove equally efficacious.

The common knot-grass *Polygonum aviculare*, Linn., a troublesome trailing wiry weed, has emetic purgative fruit. This species is not so abundant here as in the southern colonies, its place however is supplied by the closely allied species *P. plebeium*, R.Br. which probably possesses the same properties.

P. barbatum, Linn., an erect hairy species common to our creeks. Is considered a diuretic at the Cape of Good Hope, and in India an infusion of its leaves is prescribed to alleviate the pain of severe colic. The leaves of *P. hispidum*, H. B. and K., according to Humbolt are used in South America as a substitute for tobacco. This latter species Mr. Bentham thinks is identical with the large species of our swamps *P. orientale*, Linn.

Attention might be drawn to one native nutmeg, *Myristica insipida*, R. Br. This forms one of the most handsome trees of our North Queensland scrubs, and bears an abundant crop of fruit, which are more oval than the nutmeg of the shops and not so aromatic, but may possess some of its medicinal properties. The true nutmegs are said to contain a volatile oil which renders them stimulant. In small quantities they relieve flatulence and and allay colicky pains, but in large quantities they excite the circulations and act as narcotics. The bark of some Queensland trees belonging to the order *Laurineæ* is in use for flavouring, but oils in large quantities could be obtained from the fruit of *Hernandia bivalvis*, Benth., a tall tree common to the Brisbane River scrubs. This tree is readily known by the black nut-like fruit being enclosed in large inflated involucels which are often of a rich red color, the fruit is ten-ribbed, and so full of oil that a single fruit stuck on a stick and lighted will give a good light for two or three minutes.

Among our representatives of the dangerous order, *Euphorbiaceæ* or Spurgeworts there are fine timbers, useful fruits and some which produce good dyes, and many of more or less use medicinally *Euphorbia Drummondii*, Bois.; a small, almost prostrate herb, with oblong opposite leaves about a quarter of an inch long, bearing small flower-heads in their axils, has lately been sent from the Barcoo to P. R. Gordon, Esq., Chief Inspector of stock, stating that several sheep had been poisoned from feeding on it. And since then another gentleman has forwarded specimens of the same plant to the *Queenslander* newspaper, stating that an infusion of the herb proves almost a certain cure in cases of chronic dysentery and low fever.

Several species of our *Antidesmas* bear edible fruit of more or less value. *A. Dallachyanum*, Baill., the Herbert River cherry is by far the best. The fruit which in size equals that of large cherries, is of a sharp acid flavour resembling that of the red currant, which it also equals in colour when made into jelly, and as the European fruit is placed among medicinal plants on account of its juice being grateful to the parched palates of persons suffering from fever, it is surely not out of place to notice our Queensland tree in these notes.

The bitter bark of *Petalostigma quadriloculare,* F. v. M., or Emu Apple, is often used as an astringent by bushmen. The bitter principle contained in the bark is not considered of value by medical men. The bark also contains a quantity of starch.

Phyllanthus simplex, Retz. A small herb about a foot high, with, while young somewhat flattened stems; leaves small in two opposite rows, flowers in clusters. The fresh plant mixed with equal parts of cumin seeds and sugar and made into an electuary is administered by the natives of India in doses of a teaspoonful a day in cases of gonorrhœa. According to Roxburgh the fresh plant bruised and mixed with buttermilk is used as a wash to cure the itch in children. This plant is met with throughout tropical Queensland.

Croton. Several trees of this genus found in the Queensland scrubs, furnish what is called Queensland Cascarilla Bark.

Aleurites moluccana, Willd., (Candlenut). A large tree often met with along the Herbert River, &c., is cultivated in some countries for the sake of its nuts. The tree is too well known in Queensland to need description as it may be seen in most of our gardens usually under the name *A. triloba,* Forst. The kernels when dried and stuck on a reed are used by the Polynesians as a substitute for candles, and as a article of food in New Georgia. These nuts resemble walnuts somewhat in size and taste. When pressed they yield a large proportion of pure palatable oil, used as a drying oil for paint, and known as country walnut and artist's oil. In Ceylon it is called Kekune oil, and in the Sandwich Islands, where it is used as a mordant for their vegetable dyes, Kukul oil. In these Islands alone, about 10,000 gallons are annually produced. The root of the tree affords a brown dye, which is used by the Sandwich Islanders for their native cloths. According to the Pharmacapœia of India, Dr. O'Rorke found that in doses varying from one to two ozs., it acted as a mild and sure purgative producing in from three to six hours, after injection free bilious evacuations, its operation being unattended either by nausea, colic, or other ill effects. It was found to approach nearly the castor oil in the mildness and certainty of its operation, but superior to it having neither taste or smell, and as producing its cathartic action without causing any degree of nausea, whether administered in emulsion or in the pure state.

In Baron Ferd. von Mueller's useful work "Select Plants for Victorian Culture," a tree commonly met with in Queensland is spoken of—"*Mallotus philipinensis*," Mueller, Arg. Though not of great importance this bush should not be passed on this occasion, inasmuch as the powdery substance investing the seed-capsules constitutes the kamala which can be employed not only as an orange dye, but also as an anthelmintic remedy. The Hindoo silk-dyers use it for an orange colour obtained by boiling the kamalas with carbonate of soda. Dr. Lindley says the root yields the same colour as the mealy substance around the capsules, but he speaks of it as a scarlet colour. According to Lennis, in one part of India this tree is called "Corunga Munji Maram," on account of the monkeys staining their faces with the mealy substance which surrounds the capsules.

None of our naturalised plants have spread with greater rapidity over the colony than the castor oil plant, *Ricinus communis*, Linn. and if all accounts are true, few plants are of more value. Dr. Woolls in "Contributions to the Flora of Australia," says:—"*Ricinus* not only yields castor oil, but the leaves of the plant have been successfully used by Dr. Pringle as a galactopoietic." The doctor has reported two remarkable cases. The first one was that of a women who from total absence of milk in one breast, and a very limited supply in the other had lost two children in succession in early infancy. By the application of the castor oil leaves for about a week, the effect was truly astonishing, for the evil was remedied and the woman was enabled to rear her children afterwards. The second case was that of a delicate lady, who through the same simple application for three days was rendered capable of supplying the nourishment necessary for twins." Baron Mueller in "Select Plants," says the seeds contain about 50 per cent. of oil, to obtain which for medicinal purposes, hydraulic pressure should be employed and the seeds not subjected to heat.

Baloghia lucida, Endl., or Norfolk Island Bloodwood, a large tree, having dark green oblong leaves, and fragrant white flowers, is abundant on the Main Range, Enoggera, &c. On the trunk of this tree being wounded a large quantity of sap flows out, which Baron Mueller says forms a beautiful red indelible pigment without any admixture. The most dangerous of the trees of this order found in Queensland is *Excœcaria agallocha*, Linn., a small tree with somewhat fig-like leaves, often met with near salt rivers and swamps from the Brisbane northwards. The trunk abounds in a most dangerous virulent acrid milk; woodcutters upon whom this juice has flown after a stroke of their axe, reported to Roxburgh that it produced inflamation and ulceration. Rumphius states that sailors who were sent ashore in Amboyna to cut timber sometimes became furiously mad from the pain produced by the juice that fell on their eyes, and that some of them altogether lost their sight. The juice is a violent purgative.

The large climbing Peppermint, *Piper Novæ hollandiæ*, Miq., which may be seen climbing up the stems of our scrub trees like ivy, has been found by Dr. Bancroft to contain in its stem an aromatic principle which is likely to become valuable in medicine.

Aristolochia indica, Linn., a tall twining plant of *Aristolochiaceæ* or Birchworts, is one of the many plants recommended as antidotes to the bite of snakes. The root of this and other species are said to be used as purgatives and vermifuges in India. Several species of this genus may be seen in our gardens, where the singularity of their flowers always attract attention.

The first *Monocotyledonous* plant met with in our flora is *Hydrocharis morsusranæ*, Linn., the Frogbit of England and Morene of the French. The leaves are spoken of as mucilaginous and astringent. Here as in England, this is one of the prettiest plants of our still waters. Leaves thick, heart-shaped, floating; flowers white, most abundant in March on the still waters off Brisbane River.

Ottelia alismoides, Pers. A large aquatic of tropical Queensland, in India is used as a pot-herb, and at one time seems to have enjoyed some reputation for removing the effects of the venom of the sea-dog. The leaves of this plant are often submerged and six inches in diameter.

According to the Pharmacopæia of India, the leaves of the *Banana* are in common use in the Bombay General European Hospital, for dressing blistered surfaces. For this purpose it is stated a piece of the leaf of the required size, smeared with any bland vegetable oil, is applied to the denuded surface and kept in situ by means of a bandage. A pleasant soothing sensation is communicated to the blistered surface which is found generally to heal satisfactory in four or five days. For the first two days the upper smooth surface of the leaf is placed next the skin and subsequently the under side, until the healing process is complete. An abundance of Banana plants either cultivated or indigenous is always to be obtained close to hand in Queensland.

No important medicinal properties have been detected in any of our *Orchids*, yet a wholesome food might be prepared from the thick starchy stems of several species.

Our species of *Hæmodorum* a genus of *Amaryllideæ* should be tried for a red dye, which it probably possesses, similar to an allied North American plant. The plant may be obtained in quantities from most swampy places. The leaves are grass-like, panicle of flowers upright, dense and of a dingy red colour.

A few of our *Liliaceous* plants seem to have been used medicinally *Smilax glycyphylla*, Sm., is the small sarsaparilla, found on our coast, and easily known from the larger species of our scrubs by the underside of its leaves being almost white. By some it is called sweet tea. The infusion is said to be at first sweet, afterwards bitter, and to have tonic and antiscorbutic properties.

Flagellaria indica, Linn., a tall climber, known at once by the spirally twisted point of its leaf. The leaves are said to be astringent and vulnerary.

The order *Pontederaceæ*, so far as known, is represented by a single plant, *Monochoria cyanea*, F. v. M., which Mr. Bentham considers very near *M. vaginalis*, Pr. Of this latter, Dr. Lindley says it is employed in Indian pharmacy in liver complaints, and disorders of the stomach. Rubbed down in butter and drank, it is thought to remove redness of the eyes, powdered and mixed with sugar it is administered in asthma; and when chewed it is said to relieve toothache, brayed with milk it is given in fever, and finally when young is eaten as a pot-herb. If so much virtue is to be found in this East Indian species, certainly our Queensland plant should be examined. It will be met with in most of the shallow still waters of tropical Queensland, its root-stock creeping in the mud, leaves few on long stalks, flowers blue, seeds ribbed.

Cyanotis axillaris, Ræm. and Schult. Is one of the Spiderworts of tropical Australia and India, in the latter place a decoction of the plant is given in cases of tympanis.

A small rush *Luzula campestris*, DC., met with in Southern Queensland. The root has some reputation as a diuretic in Europe and China.

The root-stocks of several plants of *Aroideæ* are used by the natives for food after undergoing some preparation. The root-stock of the common Bulrush *Typha augustifolia*, Linn., abounds in starch. It is somewhat astringent and diuretic and is employed in the east of Asia in dysentery, gonorrhœa, and the measles. This well-known plant is abundant in the swamps throughout the colony.

In the large order *Cyperaceæ* or sedges, several of our species have been found to possess properties which have been taken advantage of for healing disease, but none in a very high degree. Thus the roots of *Kyllinga triceps*, Rolth., is said to be employed in the East Indies in diabetes and as a stomachic, for which its acridity combined with some aroma has recommended it.

The tubers of our pest the Nutgrass *Cyperus rotundus*, Linn., are said to be administered successfully in cases of cholera by Hindoo practitioners. *Scirpus lacustris*, Linn., the Lake Club Rush, is a tall rush found in many of our swamps, the root-stock of which is said to be employed as an astringent and diuretic.

Remirea maritima, Aubl., a tropical sedge, often seen on our tropical coast sands, which it helps to bind with its long creeping stems; is said to be a powerful diaphoretic and diuretic. *Scleria lithosperma*, Willd., a hard white-seeded sedge of which we have a form on the Brisbane River, is supposed upon the Malabar coast to have antinephritic virtues.

Gramineae or Grasses. This is undoubtedly the most interesting and useful order of plants in the whole natural system, for from it is derived the principal food for both man and beast, but few of this large order have any reputation as medicinal plants. A fragrant aromatic secretion is present in many of our *Andropogons* particularly in *A. bombycinus*, R. Br., *A. schœnanthus*, var *Martini* and *A. refractus*, R. Br. This latter species I believe has been generally looked upon as endemic, but some specimens were given me a few months back by Mr. F. J. C. Wildash, which he had gathered while in Japan, at a place where there was little probability of its having been introduced. *Elionurus citreus*, Munro, is another fragrant grass. From the roots of our common

Couch grass, *Cynodon dactylon*, Pers., a cooling drink is made in India, and a decoction of *Eleusine indica*, Geot., is also employed in Demerara in the convulsions of infants.

The notice of medicinal qualities in our *Cryptogamic* plants will be brief, yet should not be altogether passed over, for we find a few plants in this class which do possess properties of value, thus *Lycopodium phlegmaria*, Linn., one of our pretty epiphytal club-mosses is reputed an aphrodisiac, and *Helminthostachys zeylanica*, Hook, a tropical swamp fern belonging to the Adder's tongue tribe of ferns, is said to be regarded in the Moluccas as a slight aperient and it is also used as a pot-herb. The fern has a short thick, creeping root-stock from which only a single frond usually rises, which is divided into three parts, each part being generally much cut. The whole is of a succulent nature. It is also said that the fronds of *Polypodium phymatodes*, Linn , are used in the South Sea Islands for scenting the oil of the cocoa-nut. This fine fern is of common occurrence on the banks of our northern rivers, and seems to contain more fragrant oil than any other of our Queensland ferns.

Little is as yet known of our mosses, but the general character of the order *Musci* is to possess a slight astringency and diuretic property, I may mention that the genus most useful to the horticulturist—*Sphagnum*, I saw a few years back in abundance in a swamp near Maroochie.

Of our *Lichens* also little is known about their properties. *Sticta pulmonacea*, abundant on the stems of the trees at Maroochie, is used in Siberia for giving a bitter to beer, and in England is employed under the name of Lungs of the Oak as a nourishing diet for weak persons.

Parmelia perlata, and *P. perforata*, two very common Australian lichens have been used in the form of a poultice in dropsical affections, but there is much doubt about their value, it being thought that the application of continuous warmth and moisture by any other means would have been equally efficacious.

Of the beautiful and curious order *Fungi*, no species seems to enjoy a reputation for medicinal virtues, yet it is rather remarkable that while from Tahiti and other places, large quantities of a species abundant in our scrubs, *Hirneola auricula Judæ*, Fr., or Jew's ear, are shipped to China to be there used in soup, no one seems to have attempted collecting the article here. At one time this curious fungus was a popular remedy for sore throats the Rev. M. J. Berkeley says, probably from some fancied resemblance of the hymenium to the fauces. From our *Fungi* as also from our *Lichens* valuable dyes might probably be obtained.

ON QUEENSLAND FERNS, WITH A DESCRIPTION OF TWO NEW SPECIES.

BY F. M. BAILEY, F.L.S., &c.

As I am about to publish a work on the Australian Ferns, it may be as well to bring before the Society a few of the changes I propose making in the nomenclature with also descriptions of the few new species which will be found therein. Thus all the *Doodias* I propose placing as forms under the one—*D. aspera*. R. Br. The advisability of this will be patent to all who have had the advantage of observing the close approach of the various forms of the usually acknowledged two species *D. aspera* and *D. caudata*, to each other. I shall in all cases retain old names, so that those who may differ with me on this point will have no difficulty in finding the fern required. *Pteris rotundifolia*, Forst., I propose reducing to a form of *P. falcata*, R. Br., and although I retain *P. paradoxa*, R. Br. I feel persuaded that this species will before long only be looked upon as another form of *P. falcata*. The pretty fern *Cheilanthes Sieberi*, will also be retained as a distinct form of *C. tenuifolia*.

SCHIZŒA FORSTERI, Spreng.

Rhizome short, scaly. Fronds three to nine inches high, glossy, stipes light coloured, channelled; the upper portion of frond dichotomously divided into five segments, which are rather broad for the size of the frond, glossy, and taper to a neck-like contraction at the apex, thus giving a stipitate appearance to the fructification which is composed of from four to six hairy pinnules, shorter than in *S. dichotoma*, and placed digitato-pinnate, not pectinato-pinnate as in that species; spore-cases biserial as in the other Australian species.

When I first met with this lovely species it was growing at the bases of the Palm trees at Maroochie, a very rich fern locality in the Bunya Mountains, I then took it for a new species, but my excellent and learned friend, Baron Mueller identified it with the *S. Fosteri*, of Sprengel, and noticed it in the eighth volume of his valuable work the "Fragmenta Phytographia Australia," since then I met with it at Trinity Bay growing in a similar manner at, and amongst the roots of the Palms in very swampy localities.

TRICHOMANES YANDINENSE, *n.s.*

Rhizoma filiforme dense intricatum pileis ferruginosis plus minusve indutum; frondibus breve stipitatis ovatis vel cuneatis, marginibus æqualibus vel parum inæqualibus, (repandis) apice aliquando parum lobato 4 ad 5‴. Venis magnis, pinnate costiformibus venulis numerosis quasi striatis, venis marginalibus vel intramarginalibus coalescentibus. Soris 1, 2, 3, apicalibus. Indusium profunde situm basim versus attenuatum apice latum expansum, Receptaculum parum exsertum.

In truncis disjectis vel cortice arborum valles fontosas, flumine Maroochie, districtu Yandina dispersum.

Trichomanes yandinense, (new species).—Rhizome filiform densely and intricately matted and more or less clothed with ferruginous hairs. Fronds shortly stipitate ovate to cuneate, the margins even or slightly uneven (repand), the apex at times slightly lobed four to six lines long. Veins pinnately costæform with regard to the main ones, but between these are numerous striæform ones with also a marginal or intramarginal one to which they all join. Sori terminal, usually solitary at the apex of the perfect ovate frond, but on some two or three, then giving a more truncate appearance to the frond. Indusium sunk in the frond, attenuated towards the base, the mouth broad, spreading. Receptacle slightly exserted. On logs and tree trunks, Maroochie, (Yandina) situated about 80 miles from Brisbane on the Northern Road.

POLYPODIUM PALLIDUM, *n. s.*

Rhizoma breve horizontale, crassum, squamulis pallidis nitentibus indutum; frondibus 1′ *ad* 4′ *alt. bi-tri-pinnatis, pinnulis majoribus* 1′ *pinnulis secund. lanceolatis* 2″ *ad* 4″, *pinnulis minoribus linearibus obtusis* 6‴ *ad* 1″ 6‴, *alibus costulorum plus minusve constrictis. Venis pinnatis. Soris paucis vel* 14, *parvis, obscure fuscis; sporulis haud numerosis. Stipite basim versus lato, pallido, pileis, vel squamulis mollibus, marcescentibus, induto. Polypodium undique plus minusve pileis albis glandulosis indutum. Ennogera Creek prope Brisbane.*

Rhizome short, horizontal, thick, clothed with bright glossy, pale coloured scales. Fronds one to four feet high, stipes stout at the base and clothed with soft hair-like scales, which soon fall leaving the stipes glabrous and pale or glaucous as well as the rhachis, bitripinnate, larger pinnæ 1 foot or more long, secondary pinnæ lanceolate two to four inches long, pinnules linear obtuse half to one and a-half inches long, more or less connected by the narrow wing of the costa, the whole plant more or less covered with white glandular hairs. Veins pinnate. Sori from a few to fourteen on a lobe, when ripe the spore-cases often of a dark colour, all small and usually few in each sorus. Found at Enoggera Creek, near Brisbane.

There is not the least doubt but that this fern is a true *Polypodium* although it seems in the Flora Australiensis to have been placed with *Aspidium tenericaule*, Th. A mistake that might occur from the examination of dried specimens, but never from living ones; the name used is appropriate, and the plant is most likely identical with that of Bruckenridge, but none of his authentic specimens are in the colony so there is some doubt on this point.

POLYPODIUM ASPIDIOIDES, *n. s.*

Rhizoma horizontale, tenue, repens, breve. Fronde 12″*ad* 18 *generatim ovato-lanceolata (speciminibus majoribus ovato-angulata); stipite longo, gracili sulcato, ad basim dense squamoso, squamis intense fuscis, ovatis acuminatis, foliis bi-tri-pinnatis, pinnulæ apice elongatæ, superne coriaceæ, nitentæ; stipite et costulis pilosis; venis pinnatis extra marginem dentibus aculeatis terminatis. Soris mediatis. In ripas umbrosas Brisbane fluminis abundans, foliis vel frondibus nitentibus facile detectum.*

Rhizome horizontal, thin, shortly creeping. Fronds 12 to 18 inches long, usually ovate-lanceolate in the small form, but more triangular-ovate in the larger, in outline, the stipes long, slender, sulcate and densely covered at or near the base with dark brown ovate acuminate scales, bitripinnate, the pinnæ and lower pinnules much elongated at the apex, the upper surface glossy, rhachis and costules hairy. Veins pinnate ending beyond the margin in aculeate teeth. Sori medial. Found abundant in the Brisbane River scrubs, and at once detected by the shining upper surface of the fronds. This beautiful fern has been for a long time confused with *Lastrea acuminata*, T. Moore, *Aspidium acuminatum*, Hort., Ang., but from which it differs in the absence of indusia and in the longer, more aculeate marginal teeth.

Var. *tropica*. This form has been thought to be identical with the species called by Blume *P. rufescens*. It differs slightly from *P. aspidioides* in wanting the gloss on the upper surface of frond, is less divided, often wanting the marginal teeth, being more crenulated on the obtuse pinnules, the close, soft, pubescence having also a reddish tinge, these variations might in a great measure be due to climate. Ranges, Trinity Bay Queensland.

ACROSTICHUM NEGLECTUM, *n.s.*

Rhizoma squamosum, fuscum, durum, Lomariæ simillimum, frondibus fertilibus et sterilibus 1′ *ad* 3′ *alt. lanceolatis, profunde pinnatifidis,* *segmentis angustis, linearibus, marginatis. Stipite frond. steril. alibus dentatis vel lobatis marginatis, segment. lanceolatis, serratis, dentibus serratis vel aculeatis, long. 3″ ad 6″, lat. 6‴ ad 9‴. Alæ supradictæ lat. 6″. Venis ut in A. repandum.*

In vallis perumbrosis, Trinity Bay Range.

Rhizome creeping, scaly, dark coloured, hard. Fronds of two kinds like a *Lomaria*, one to three feet high, lanceolate in outline, deeply pinnatifid, stipes in the fertile frond more than half its length, and bordered by a narrow wing, segments linear, joined by the narrow wing of rachis, but not decurrent, one and a-half to three inches long. Stipe of sterile frond half the length of frond, bordered by a toothed or lobed wing to the base, segments lanceolate coarsely serrated, teeth almost aculeate, and some again serrate, three to six inches long, half to three-quarter inches broad, joined at the base by the wing of rhachis which is about half an inch broad, veins as in *A. repandum*.

I met with this beautiful species in a close gully of the Trinity Bay Ranges, in May 1877. Dr. Prentice tells me that Mr. W. Hill brought the same species from the North of Queensland several years before, and that he saw while on a visit to England a specimen of the same labeled in J. Smith's herbarium as *A. repandum*, from which it differs widely, both according to the diagnosis given in Hooker's "species *Filicum*," with which our form of *A. repandum* perfectly agrees.

I forward typical specimens of the following:—*Schizæa Fosteri*, Spreng.; *Trichomanes yandinense, (n.s.)*; *Polypodium aspidioides, (n.s.)* also var. *tropica, (n.s.)*; and *Polypodium pallidum*.

On some Polyzoa from the Queensland Coast.

By William A. Haswell, M.A., B.Sc.

[Plates 1—3.]

Among a large series of *Polyzoa* which I obtained while at Port Denison last spring, are many rare and some new species, and of these the present communication is an account. Nearly all the specimens were obtained with the dredge in a single spot close to Holborn Island, an islet situated about twenty miles to the north-east of Port Denison, and about forty to the westward of the Great Barrier Reef. Here the bottom at a depth of about twenty fathoms seemed to be covered with little else than numerous kinds of *Polyzoa*, intermixed with species of *Plumulariidæ* and *Sertulariidæ* and a few shells. Many of the *Polyzoa* are massive branching forms, which, judging from the contents of the dredge and hempen tangles, seem to grow here in great profusion, and are no doubt in the act of forming by their gradual growth and decay more or less extensive deposits analogous to the Polyzoa-beds characteristic of the tertiary formations of South Australia and Europe. It would be interesting to determine the extent of this remarkable bed: bad weather prevented us doing anything in this direction; it is unusual to dredge *Polyzoa* in abundance at so slight a depth, but no doubt the sheltering influence of the Great Barrier is a sufficient explanation,* and it is not unlikely that a similar growth may occur commonly within the Barrier at like depths, in situations where the set of the current does not favour the deposition of coral mud from the reefs.

I regret having been unable to obtain in Sydney some of the the works bearing on the present subject; I have particularly to regret the want of D'Orbigny's "Paléontologie Française," Hagenow's "Bryozoen der Maestrichten Kreidebild," and the "Natural History Review," the volume of which for 1858 contains descriptions of various Australian *Polyzoa* by Prof. Sir Wyville Thomson.

Unless otherwise particularised the habitat of the species is Holborn Island, 20 fathoms.

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* A similar abundance of *Bryozoa* has been recently noticed at a depth of 40 fathoms in the Mediterranean; *vide* "On the Bryozoa of the Bay of Naples," by A. W. Waters, F.G.S., Ann. and Mag., Nat. Hist. (5) III. p. 280.

Sub-order CYCLOSTOMATA.

1. Crisia terræ-reginæ, *sp. nov.*, Plate I., fig. 1.

Cells 16—22 in each internode, closely punctate, prominent, the free portion inclined forwards; mouth circular, entire; branches arising from the eighth to the thirteenth cell of the internode; joints black.

The free portion of the cell in this species is not so long as in *C. incurva;* the length of the internodes distinguishes it from the other described Australian species. From *C. elongata*, M.-Edw., as figured and described by Busk, is is distinguished chiefly by the general habit, and the colour of the nodes; from *C. eburneo-denticulata*, Smitt, to which it is also allied, it is distinguished by the number of cells in each internode and the point of origin of the branches.

2. Idmonea radians, *Lamk*

3. Idmonea milneana, *D' Orbigny.*

A much more delicate variety than that met with in Port Jackson, and having the mouths of the cells relatively larger.

4. Idmonea irregularis, *Meneghini.*

5. Idmonea marionensis, *Busk.*

Colour light purple.

6. Pustulipora delicatula, *Busk.*

7. Pustulipora proboscidea, *E. Forbes.*

8. Pustulipora australis, *Busk, var. ?*

Resembles *P. australis*, in habit and in the form of the cells; but the summits of the papillæ are not black.

9. Pustulipora fragilis, *sp. nov.*, Plate I., fig. 2.

Zoarium very slender, sub-cylindrical, cells elongate, exserted, curved outwards, separated by wide intervals; the general surface covered with numerous minute black-pointed spinules.

10. Pustulipora clavaeformis, *Busk.*

11. Retihornera foliacea ? *MacGillivray.*

Hab. Port Denison ; a small fragment probably of this species.

Sub-order Cheilostomata.

12. Salicornaria tenuirostris, *Busk.*

I can find no avicularia on my specimens, but the close correspondence in the form of the cells and the general habit leaves little doubt of the correctness of the determination.

13. Nellia oculata, *Busk.*

14. Onchopora ventricosa, *sp. nov.*, Plate I., fig. 3.

Cells elongate, projecting a little at the oral end ; covered with irregular granulations ; mouth with a shallow, open sinus in the lower lip.

An ally of *O. mutica* of Busk, (Q. Journ. Micro. Sc., vol. iii., p. 321, pl. iv., figs. 2, 3) but with the cells longer and less crowded.

15. Onchopora immersa, *sp. nov.*, Plate I., figs. 4, 5.

Zoarium dichotomously branched ; branches cylindrical ; cells immersed ; surface ornamented with large pores.

16. Onchopora granulosa, *sp. nov.*

Cells short, ventricose, cell-wall granulated, mouth not produced, with a shallow sinus in the lower lip.

Distinguished from *O. ventricosa*, by the greater shortness of the cells, and the closeness of the granulations on the surface.

17. Cabarea rudis, *Busk.*

18. Cabarea lata, *Busk.*

19. Cellularia cuspidata, *Busk*, var.

The spine on the upper and outer angle of the cell is extremely short and blunt.

20. Scrupocellaria cervicornis, *Busk.*

A small scrap, seemingly of this species, from Holborn Island.

21. Scrupocellaria diadema, *Busk.*

22. Scrupocellaria Macandrei, *Busk.*

23. Scrupocellaria clypeata, *sp. nov.*, Plate I., fig. 6.

Cells elongate, narrow, provided with a pedunculate operculum which is long and narrow, extending much further in front of the peduncle than behind, pointed in front, broader and truncate behind; aperture ovate, margin prominent, armed above with two small spines.

24. Scrupocellaria obtecta, *sp. nov.*

Cells provided with a large operculum covering the greater part of the front of the cell, and occupied by a system of branching canals of which the central one is much broader than the others. A sessile avicularium on the inner side of the summit of each cell; no marginal spines. Ovicells punctate.

Distinguished from *S. cervicornis* by the greater size of the operculum and its attachment by a broad base, and the absence of marginal spines.

25. Halophila Johnstoniae, *Gray.*

26. Carbasea episcopalis, *Busk.*

27. Carbasea cribriformis? *Busk.*

If the present species is identical with that described by Busk, he can only have had under examination a small fragment, as he makes no allusion to the very remarkable habit of the species, beyond noticing the cribriform structure of the fronds. The frond is wound spirally around an imaginary axis, the breadth decreasing in successive whorls; the size of the whole structure is sometimes very considerable.

28. Membranipora Rosselii, *Audouin.*

Hab. Holborn Island, 20 fathoms; Port Denison, 5 fathoms.

29. Membranipora Lacroixii, *Savigny, (sp.)*

Worn specimens, apparently referable to this species, from both Holborn Island and Port Denison.

30. Membranipora magnilabris, *Busk.*

31. Membranipora cervicornis, *sp. nov.*

Cells oval, margin but little raised, aperture protected by three to five closely approximated, branching, antler-like process, which arise from one side of the cell and almost entirely hide the mouth; a strong vibraculum placed as in *M. pilosa* on the front wall of the cell below the mouth.

Hab. ?

32. Biflustra armata, *sp. nov.*, Plate I., fig. 7.

Zoarium rigid, free, folded on itself. Cells very large, their walls thick, defined by a narrow ridge which is most prominent above. Usually a small, pointed avicularium on the upper part of the cell-margin at the side of the mouth.

This species is distinguished from *B. delicatula*, Busk (*Crag. Polyzoa*, p. 72. pl. i., figs. 1, 2, and 4), chiefly by the presence of the avicularium and the absence of the serrate denticle.

33. Biflustra crassa, *sp. nov.*, Plate I., fig. 8.

The cells are somewhat irregular in size, oblong, surrounded by a narrow rim, free from any trace of avicularia; the membrane punctate.

34. Lepralia malusii, *Audouin, (sp.)*

Hab. Port Denison, Holborn Island, etc., commonly distributed on the Australian coast from low-water mark to a considerable depth.

35. Lepralia pertusa, *Esper. (sp.)*

36. Lepralia (Schizoporella) *sp.?*

Cells sub-ventricose, separated by narrow, raised lines; mouth sub-quadrate, surrounded by an inconspicuous rim, a small sinus in the lower lip, and an avicularium on one side above the mouth; anterior surface covered uniformly with round pores. Colour brown.

A species so common on the Australian coast that, though I am unable to identify it with any of the described species known to me, I hesitate about giving it a specific name.

37. Lepralia spinifera, *Johnston, var?*

Cells immersed, slightly ventricose, uniformly ornamented with large punctations, a small avicularium on either side of the mouth; no spines.

38. Lepralia irregularis, *sp. nov.*, Plate II., fig. 1.

Cells immersed, not defined; surface ornamented with very irregular, wide fenestrae. Mouth of irregular shape. Colour light purple.

39. Lepralia (Schizoporella) Quadlingi, *sp. nov.*, Plate II., fig. 2.

Cells immersed, not distinctly separated, cell-wall covered with small, somewhat irregular, pentagonal reticulations. Mouth with an open sinus below; ovicell indistinctly reticulated.

40. Lepralia (Schizoporella) assimilis, *sp. nov.*

Cells ovate, ventricose, surface granular; a raised avicularium on each side at the top of the cell close to the mouth; mouth with a narrow sinus in the lower lip. Ovicells globose, uniformly granular.

Allied to *L. spinifera*, Johnston, but distinguished by the absence of the characteristic sculpture on the ovicell.

41. Lepralia Mortoni, *sp. nov.*

Cells ovate, ventricose, cell-wall uniformly punctate, a single, vertically placed avicularium (with the apex downwards) a little below the mouth. Mouth sub-circular with a slight raised margin. Ovicells uniformly ornamented with ocelliform markings. On a shell.

42. Lepralia lunifera, *sp. nov.*

Cells ovate, slightly ventricose, uniformly covered with minute granules. A semilunar aperture in the middle of the cell-wall behind the mouth; mouth semicircular, an avicularium at each angle. On a shell.

43. Lepralia (Schizoporella) Gandyi, *sp. nov.*

Cells hexagonal in outline, ventricose, separated by depressed lines. Cell-wall hyaline, ornamented, except in its central portion, with small ocelliform markings. Mouth semi-circular, a deep sinus with a contracted orifice, in the lower lip. Ovicells globose, sub-granular.

44. Cellepora pumicosa, *Linn.*

45. Cellepora fusca, *Busk.*

46. Cellepora laevis, *sp. nov.*, Plate II., figs. 3 and 4.

Zoarium consisting of thick sub-cylindrical, sometimes anastomosing branches. Cells smooth, porcellanous, some prominent, ventricose, others immersed, the mouth devoid of rostrum or projecting rim; no avicularia; ovicells galeate, reticulate, with a large aperture; two small circular marks on each of the opercula and the lid of the ovicells.

47. Cellepora granulosa, *sp. nov.*

Zoarium branched, the branches sub-cylindrical. Cells irregularly aggregated, ventricose, coarsely granular. Cell-aperture circular, margin thick, produced on one side into a blunt rostrum. An ovate avicularium on the inner aspect of the rostrum and others of various sizes and shapes scattered over the zoarium.

48. Eschara hexagonalis, *sp. nov.*, Plate III., figs. 1 and 2.

Branches narrow, strap-shaped. Cells hexagonal, separated by a distinct depressed line, punctate or smooth. Mouth nearly circular, a round aperture below it; cell-wall bulging below, the prominence armed with a narrow pointed avicularium.

49. Eschara umbonata, *sp. nov.*, Plate II., figs. 5 and 6.

Cells not defined; mouth varying in form, the lower lip sometimes straight, sometimes with a small sinus, sometimes with a rounded central lobe. Surface ornamented with numerous rounded knobs of various sizes, and small scattered avicularia. [Small pieces only].

50. Hemeschara australis, *sp. nov.*, Plate II., figs. 7 and 8.

Zoarium branching, arborescent. Cells oblong, defined anteriorly by narrow raised lines, scarcely separated laterally; surface uniformly punctate. Mouth surrounded by an obscure raised rim which is beaded below; an open sinus in the lower lip.

51. Retepora cellulosa, *Jameson, (sp.)*

Hab. Port Denison; Holborn Island.

52. Vincularia novæ-hollandiæ, *sp. nov.*, Plate III., fig. 3.

Zoarium dichotomous, branches sub-compressed. Cell oblong, surrounded by a finely-beaded raised rim; mouth circular; anterior surface of cell, granular, much depressed near the mouth and perforated in that situation by two large ovate apertures which are sometimes closed by a thin membrane.

53. Coneschareliina? depressa, *sp. nov.*, Plate III., fig. 4.

Zoarium depressed-conical, with toothed edges formed by the projecting outer row of cells. Cell-aperture ovate—the long axis radial—surrounded by a prominent margin—especially prominent in the outermost row of cells. Large, sessile, sub-triangular avicularia situated between the rows of cells, and at irregular intervals shallow circular depressions, (vibracular pits) at the bottom of each of which is a narrow semilunar slit, with the concavity directed outwards. Under surface of the zoarium flat, perforated by close-set circular pores, each occupied, either at the surface or at a varying depth, by a thin, translucent covering, perforated by several minute porules, usually with a rather larger one in the centre.

Hab. Port Denison.

54. Conescharellina conica, *sp. nov.*, Plate III., figs. 7 and 8.

Zoarium conical, much elevated. Cell-apertures and avicularia in alternate, radiating rows; cell-apertures circular or oval, with a projecting lip on either side. Avicularia raised, triangular; upper (movable) mandible with the apex usually more or less produced.

55. Selenaria maculata, *Busk.*

56. Selenaria fenestrata, *sp. nov.*

Differs from the preceding in the presence of two small fenestræ on the wall of each cell.

57. Sphaeropora fossa, *gen. et sp. nov.*, Plate III., figs. 5 and 6.

Zoarium sub-spherical, slightly depressed, with a circular pit at the upper pole; whole surface occupied by cells. Cells and vibracular pits very irregularly arranged; cells ventricose, granular; mouth semicircular; a secondary aperture, larger than the mouth and of similar form, occupied by membrane.

The most remarkable point about this curious species is the pit at its upper pole. This is always present and in the same position; it is large enough to admit the point of an ordinary stout sewing needle, (being about ·75 mm. in diameter at the mouth), and penetrates about half the thickness of the zoarium, gradually narrowing as it descends.

58. **Myriozoüm australiense**, *sp. nov.*, Plate III., figs. 9—11.

The extra-opercular portion of the cell in this species is very prominent, and displays a little below the mouth a rounded aperture. The margin of the mouth is crenulated, and there is a rather prominent, bifid lower lip. The operculum is situated deeper than the level of the general external surface of the polyzoary. The cells are separated from one another by delicate radiating partitions, and the breadth of each is circumscribed in the older and thicker branches of the polyzoary by delicate semi-transparent lamellæ, which extend from the outer wall, just below the operculum of the cell downwards and inwards so as to cut off an internal and an external chamber, the former dilating upwards and occupied by the polypide, the latter empty. In the younger portions of the polyzoary the radiating septa sometimes meet in the centre; in the older portions in which the number of cells in each whorl is greater, there is a central axial canal within the walls of which the septa do not extend; towards the upper end of each internode in the neighbourhood of the thick nodal transverse septum, this central canal becomes divided into a series of minute canaliculi. The number of cells in each whorl varies from six to ten.

Sub-order CTENOSTOMATA.

59. **Amathia convoluta**, *Lamx.*

Hab. Port Denison and Holborn Island.

EXPLANATION OF PLATES.

Plate I.

Fig. 1.—*Crisia terræ-reginæ*, magnified 20 diameters.
„ 2.—*Pustulipora fragils*, magnified 20 diameters.
„ 3.—*Onchopora ventricosa*, magnified 44 diameters.

Fig. 4.—*Onchopora immersa*, magnified 44 diameters.
,, 5.—The same, natural size.
,, 6.—*Scrupocellaria clypeata*, magnified 44 diameters.
,, 7.—*Biflustra armata*, magnified 20 diameters.
,, 8.—*Biflustra crassa*, magnified 20 diameters.

Plate II.

Fig. 1.—*Lepralia irregularis.*
,, 2.—*Lepralia Quadlingi*, magnified 44 diameters.
,, 3.—*Cellepora lævis*, natural size.
,, 4.—The same, magnified 44 diameters.
,, 5.—*Eschara umbonata*, magnified 44 diameters.
,, 6.—The same, natural.
,, 7.—*Hemeschara australis*, natural size.
,, 8.—The same, magnified 44 diameters.

Plate III.

Fig. 1.—*Eschara hexagonalis*, magnified 44 diameters.
,, 2.—The same, natural size.
,, 3.—*Vincularia novæ-hollandiæ*, magnified 44 diameters.
,, 4.—*Conescharellina (?) depressa*, magnified 44 diameters.
,, 5.—*Sphæropora fossa*, natural size.
,, 6.—The same, magnified 44 diameters.
,, 7.—*Conescharellina conica*, natural size.
,, 8.—The same, magnified 44 diameters.
,, 9.—*Myriozoum australiense*, natural size.
,, 10.—Transverse section of the same just below an internode shewing on one side the oblique internal dissep ments; magnified 44 diameters.
,, 11.—External portion of a cell of the same, magnified 4 diameters.

DESCRIPTION OF A NEW SPECIES OF GALAXIAS FROM MOUNT WILSON, WITH REMARKS ON THE DISTRIBUTION OF THE GENUS.

BY WILLIAM MACLEAY, F.L.S., &c.

GALAXIAS COXII,

B. 7. D. 10. A. 11. V. 7. P. 12.

Height of body one-sixth of the total length; length of head about one-fifth of the same. Head broad and depressed between the eyes. Eyes about one-fifth of the length of the head, and less than half their diameter distant from the mouth. Mouth large and slightly oblique, the maxillary extending to below the middle of the orbit. Teeth in the jaws in a single row, acute, rather distant and interspersed with a few of larger size; those on the palate in a series of about seven on each side of a central longitudinal ridge, and those on the tongue in two series of strong, acute, slightly hooked teeth, five or six in number, separated by a very deep longitudinal groove. The pectoral and ventral fins are about the same length, and have a pointed look owing to the middle rays being the longest; the dorsal and anal are about equally long, the latter commencing opposite the middle of the former; the caudal is truncated and is rather broad and spreading. The colour in the fresh specimen is greenish olive, spotted all over with dark drown, the spots towards the tail sometimes coalescing so as to look like "fasciæ," the belly is yellowish, there is a large oblong black spot behind the operculum just above the base of the pectoral fin. All the fins are of a beautiful reddish-pink colour tipped with black.

Three specimens, seven inches long.

I am indebeted to the Honble. E. K. Cox, M.L.C., for the specimens from which the above description is taken. They were taken by him from a small rivulet on or near the summit of Mount Wilson. The height of the mountain is about 3,500 feet above the sea, and the rivulet takes its rise in a spring on its summit, and forms, in its short course before it leaps into the Grose Valley, lying about 2,500 feet below, a series of small shady cool pools, at different elevations, which are the abodes of this fish. The species has never, I believe, been found in the Grose River or any of the tributaries of the Nepean and Hawkesbury, and I think we may safely take it for granted that it is not to be found in them, as the Nepean and its tributaries were very closely searched some years ago by Mr. Krefft, when investigating the fresh water Fishes of Australia.

The fall into the Grose Valley may probably be too precipitous to admit of even the ova of the Fish reaching the river in safety, but there is another mode of accounting for the absence of this Fish in the lower portions of the stream in which they have been found, and that is in the difference of temperature. The difference between the shady pools on Mount Wilson and the exposed and shallow pools of the Grose or Nepean Rivers must be immense, and it may well be, that the Fish cannot survive the great change of temperature. The genus *Galaxias* is in this respect very remarkable. It is peculiar to the rivers flowing into the Pacific south of the tropics, and apparently becomes more abundant as the colder latitudes are reached. It is rare in the rivers of New South Wales, more abundant in Victoria, still more so in Tasmania and New Zealand, and is found in the rivers of southern Chili, Magellan Straits, and the Falkland Islands.

The species described up to the present time are as follows:—

G. alepidotus, Forst., Cuv. and Richards=*Forsteri*, Cuv. and Val. New Zealand.

,, *truttaceus*, Cuv. and Val., Richards. Van Diemens Land.

,, *olidus*, Gunth. ? Queensland.

,, *fasciatus*, Gray, Cuv. and Val., Richards,=*brocchus* and *reticulatus*, Richards. New Zealand and Auckland Islands.

,, *attenuatus*, Jenyns, Cuv. and Val.,=*scriba* and *maculatus*, Richards. New Zealand, Van Diemens' Land, Falkland Islands and the Southern parts of Chili.

G. Kreftii, Gunth., Cat., p. 211. Sydney, Murray Rivers.
„ *scriba*, Cuv. and Val. Port Jackson.
„ *maculatus*, Jenyns, Cuv. and Val. Tierra del Fuego.
„ *alpinus*, Jenyns, Lakes, Tierra del Fuego.
„ *punctatus*, Gunth., Cat. p. 212. Eastern Creek, N. S. Wales.
„ *brevispinis*, Gunth.=*grandis*, Von Haast. Lakes Coleridge and Guyon, N. Z.
„ *gracillimus*, Canest. Chili.
„ *Waterhousei*, Krefft. South Australia.
„ *ocellatus*, Casteln. River Yarra.
„ *versicolor*, Casteln. In Marsh St. Kilda, Melbourne.
„ *cylindricus*, Casteln. Lower Yarra, Melbourne
„ *delicatulus*, Casteln. Yarra River.
„ *amœnus*, Casteln. Yarra River.
„ *ornatus*, Costeln. Cardinia Creek, Victorian.

These in addition to the one *(Coxii)* now described are all that can be recognised as species with any certainty. Three others have been named as coming from South Australia—*G. obtusa* and *rostratus*, by Klunzinger in the "Arch fur Natur," 1872, p. 41. and *G. Schombergii*, by Peters in the "Monalth. Ak. Wiss. Berlin," 1868, p. 455, but as these publications are not procurable here, and as the authors alluded to have not thought it necessary to send a copy of their Papers to any of the scientific Societies of these Colonies, they cannot be aggrieved if they find their work necessarily ignored.

The species I have now described is the largest I have seen, but I have no doubt that an examination of the rivers rising in the Snowy Mountains, such as the upper waters of the Snowy River would make us acquainted with even larger species.

The general name given to all the species of *Galaxias* is "Trout," more I should think from their spotted appearance than from any actual resemblance, but like the trout they are good for the table, and I feel pretty confident they would yield good sport to the angler.

ON TWO HITHERTO UNDESCRIBED FISHES WELL-KNOWN IN THE SYDNEY MARKET.

BY WILLIAM MACLEAY, F.L.S., &c.,

The enquiry now being conducted by the Fisheries Commission of which I am a member, has revealed the rather remarkable fact that two of the best known and most highly prized of the marketable fishes of these seas, have hitherto entirely escaped the notice of Ichthyologists. They are:

1. OTOLITHUS TERAGLIN.

D. 10 1/30-32. A. 1/8. L. lat. 70.

Height of body nearly one-fifth of total length, length of head one-fourth of the same. Lower jaw slightly longer than upper, maxillary extending to behind the vertical from the posterior margin of the orbit. Teeth acute and slightly recurved, but without canines or larger teeth. Eye large, one-eighth of the length of the head, and distant about two diameters from the point of the snout. Præoperculum rounded at the angle, and distantly denticulated. Pectoral fins pointed, and more than half the length of the head, with a large skinny flap in the upper part of the axil. Soft dorsal with a scaly sheath at base; caudal fin broad and slightly emarginate. Colour bluish-silvery, lighter on the belly; all the fins of a dark tinge excepting the ventrals, which are white with the space between the first and second rays black.

This fish is abundant on our coasts, and attains a very considerable size—three or four feet in length. It is known to the fishermen as the "Teraglin," and I have made that its specific name. It belongs like the "Jew Fish" *Sciæna antarctica*, of Castelnau, to the *Sciænidæ*, a family said by Dr. Gunther to be unknown in Australia.

2. SYNAPTURA NIGRA.

D. 57. A. 47. C. 14. L. lat. 77 on the body.

Height with fins, two-thirds of total length. Mouth about equally developed on both sides, with numerous short cutaneous filaments, extending on the blind side over a large portion of the head. The upper eye very slightly in advance of the lower, and about two diameters of the orbit apart from it. The pectoral fin on the right side a little less than one-third of the length of the head, that on the left side a little smaller. Scales firm and hard their apices glassy-looking and armed with seven or eight acute points, on the right side; those on the blind side of the same form and size, but not so strongly armed, and of an uniform yellowish-white. The colour on the right side is black, the glassy-looking apex of the scales giving it a greyish hue, the left side is entirely yellowish-white. The vertical fins are tipped with white.

This is the best of our Flat Fish. It is generally called the "Sole," (though that name is often given to other species of the *Pleuronectidæ)* and is abundant at the proper season in Botany Bay at the mouth of Cook's River. It is also found in Port Jackson. The average size of an adult fish is about 10 inches in length, by six in height.

NOTES AND EXHIBITS.

J. Brazier, Esq., C.M.Z.S. etc., exhibited five proof sheets of *Brachiopoda*, from the new species obtained by H. M. S. "Challenger." Also "The Zoology of the "Magenta"."

Mr. Masters exhibited specimens of *Puffinus gavius* and *Arses telescopthalmus ;* both new to the Australian Fauna, and a Monkey from Borneo, *(Nasicus larvatus)* sent to the Hon. W. Macleay by Count de Lansberge, Governor General of Netherlands India.

Mr. Palmer exhibited some palms and other plants brought from Lord Howe's Island by Mr. Armstrong.

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WEDNESDAY, FEBRUARY 25TH, 1880.

The President, the Rev. J. E. Tenison-Woods, F.G.S., F.L.S., &c., in the Chair.

MEMBERS ELECTED.

The Rev. Benedict Scortechini, Logan River, Queensland, and James Garland, Esq., Wagga Wagga.

DONATIONS.

Philosophical Society of South Australia, Transactions and Proceedings for 1879.

Mitthelungen aus der Zoolog. Station zu Neapel.

Rev. Dr. Woolls—Lectures on the Vegetable Kingdom.

The President—Three Vols. Horticultural Magazine, Papers and Proceedings of the Royal Society of Tasmania, Nos. 5 and 8 of the Natural History Review.

PAPERS READ.

ON SOME OF THE FUNGI OF NEW SOUTH WALES AND QUEENSLAND.

BY REV. J. E. TENISON-WOODS, F.G.S., L.S. &c., &c., PRESIDENT OF LINN. SOC., N.S.W., AND F. M. BAILEY, F.L.S., COR. MEM. R. S. TAS., &c., &c.

Whatever attention has been paid to the botany of Australia by such illustrious and eminent scientific men as Robt. Brown, Hooker, Bentham and Baron Mueller, we must admit that there are some departments of the science which have been comparatively neglected. These are notably the Mosses, Lichens, and Fungi. The latter have never been approached in a systematic manner by any author. A list was published in the Journal of the Linnean Society in 1873, Vol. XIII., p. 155, by the Rev. J. M. Berkeley, which dealt with specimens sent to Europe from time to time by Baron Mueller, Dr. R. Schomburgck, Dr. Woolls, C. Moore, &c., &c. This list formed with that given in Hooker's Tasmanian Flora our only Australian literature on the subject.

For some years past one of us (Bailey) has devoted some attention to collecting fungi in Queensland. These have been regularly forwarded to C. E. Broome, of Bath, a notable authority on the Order, who with the Rev. J. M. Berkeley has already published a paper in the transactions of the Linnean Society of London, containing about one hundred species, several of which are new. Another paper by the same authorities is in course of preparation, which will be found to contain a far greater amount of novelties—but while one of us has been working up the Queensland species the other has taken advantage of many opportunities for observing, collecting and classifying specimens of this most interesting order in New South Wales. We purpose therefore to furnish a contribution to Australian Mycology, and so far as possible to popularize the subject with a view to stimulate enquiry. To accomplish this, we shall give short notes on the genera and the more remarkable species. Thus it is hoped that they will for the most part be easily recognized without recourse to an extensive library.

Before proceeding to the enumeration of such species as we are acquainted with, a few general observations may be of interest. It might be thought that in the dry and arid plains of Australia there would not be many favourable localities for fungi, which for the most part affect moist and shady situations. For a great many genera and species this is true. But rotten trunks and decaying trees are found almost everywhere, and burnt surfaces with much charred wood are also very common in Australia since bush fires are of yearly occurrence. A very large tribe also is almost exclusively confined to the bark of trees, that is the *Polyporei*, which are amply represented in the continent. In our open pastures at various times of the year, and especially where sheep have been fed, the common mushroom, *Agaricus campestris*, Linn., and several other *Agarics* are found. These plants do not figure largely in collection on account of the great difficulty in preserving them. *A. conicus*, sometimes is met with in New South Wales and is supposed by some to have been introduced. It may be easily known by turning black when bruised. The species is eaten in Europe. In Queensland amongst old grass during continued wet we met with quantities of *Stereum nitidulum* Berk., (Hook., Lond. Journ., 1843, p. 638.) The curious dark-coloured, flat-topped, puff-ball, *Bovista lilaeina*, Mont. et Berk., is not uncommon on plains. This species does not seem very esculent, but according to Messrs. Berkeley and Broome in their account of the Ceylon fungi in (Linnean Society Journal, Vol XIV., p. 78.) that it is regularly sold as an article of food in the Indian bazaars. The same pasture is often dotted with another puff-ball, *Scleroderma Bovista*, Fr., but in New Zealand *Lycoperdon pusillum*, is the one met with, *S. Bovista* while young, cut into slices is considered an excellent addition to sauces and stews.

Our open forests have their peculiar fungi, on the ground about stony dry ridges the beautiful *Trametes perennis*, Fr., may frequently be seen as well as several species of *Clavaria* and *Polysaccum olivaceum*. This last is a very dark, hard fungus, and has somewhat the appearance of the common puff-ball, but on examination it will be found to be formed very differently inside. Amongst the many *Polypori* found on forest trees none will so frequently be seen as *P. ignarius*. This very dark brown species seems to be particularly fond of the rugged bark of our *Casuarina*. Some of the large *Polypori* are known to bushmen by the name of "Punk." *P. igniarius* is said to be used in some parts according to one author (Gardiner's Chron., 1862, p. 21) for holding æreal plants in lieu of flower pots, for which purpose the pores and part of the inner substance is removed. The pileus is then inverted and fastened in some position where it can be filled with light soil and used for plants requiring but little moisture. Fine red-coloured species *P. cinnabarinus*, Fr. and *P. sanguineus*, Fr., may both often be observed in abundance in the damp parts of forests on any old timber, and from their bright colors are sure to attract attention. These species are widely spread in Australia and other warm countries ; in Queensland they are often accompanied by *Dædalea Sprucei*, Berk., and *Trametes pictus*, Berk. The rough bark of sheaoaks, casuarinas is often covered with the beautiful dark-brown velvety *Polyporus cichoraceus*, Berk. But it is in the scrubs lining the watercourses on the eastern side of the Dividing Range that the greatest variety of the genus *Polyporus* will be seen and conspicuously the Fan fungus *Polyporus flabelliformis*, Fr. and goblet-shaped *P. xanthopus*, Fr., two easily recognised species even from their appropriate specific names. The same may be said of *P. hirsutus*, Fr., whose pileus is usually covered with somewhat soft, scaly hairs. A very abundant kind on scrub-logs is the large white *Lenzites deplanata*, Fr., whose curious hymenium closely resembles that of a *Dædalea*. Though not regarded with much esteem as esculents, yet some species of the tribe *Polyporei* have been, and are used as articles of food in other parts of the world. Generally speaking they are not favorites, but at the same time it might be well to experiment with some of the Australian kinds.

In the close dark scrubs of Queensland one may often meet with logs the tops of which are bordered with the large cups of *Thelephora lamellata*, B. et C. These cups frequently grow one within another, but when seen singly they will often measure from 8 to 10 inches across. Where the ground is soft, formed of a leafy mould the pretty earth-star *Geaster saccata*, Fr., and others will be common, and should the season be warm and wet several species of the tribe *Phalloidei* may be met with, such as the red star, a kind resembling somewhat the sea anemone. This is the *Aseröe rubrum* of Labillardiere. The ball-net *Ileodictyon gracile*, Berk., and the superb new species of *Dictyophora—D. multicolor*, B. et Br. Most species of this tribe are attractive to the eye, but unfortunately they usually possess a most fetid odour. In drying some care is required or both their color and shape will be lost. With the *Ileodictyon* the best mode is to fill the inside of the net with some soft material while the plant is fresh, which may be done by passing cotton wool through the meshes of the net and then placing it in the sun to dry quickly. The other species should be laid upon clean white paper in the hot sun and kept frequently turned to prevent them adhering. By this quick mode of drying the color and also the shape in great measure can be preserved. In the same localities we shall probably meet with several species of *Lentinus* which are tough mushrooms, *L. fasciatus* Br. is one of the most common in Queensland. In form it resembles a wine glass, is of a brownish-light or dark colour, and very shaggy. Its favorite position is on half-rotten logs. These shaggy cups are sometimes large being five or six inches and three or four across the top of cup. But the finest of the genus is probably that found by Mr. Bailey in the scrub at the Gap, Enoggera Creek, near Brisbane. It has since been named *L. cyathus*, by Messrs. Berkely and Broome, and will be found amongst those described by them in the transactions of the Linnean Society, Vol. I., part VI., p. 399. This superb species stands erect like a large wine glass, is about four inches across, the gills are narrow and unbranched, about six inches high. The stem is about seven lines thick. In similar localities logs are often seen decorated with large paper-like lobes of various colors these are species of *Stereum*, a buff colored fungus. Another kind has finger-like lobes and is called by Messrs. Berkeley and Broome *S. radiato-fissum*. It is sure to attract attention in any place where it occurs. At the base of stumps will be noticed the shiny bright species *S. hirsutum*, Fr. The curious form of mycelium called by the botanist *Rhizomorpha Harrimanni*, is often abundant on old timber and is the mycelium of *Xylaria polymorpha* Fr., and *X. rhytidophloia*, Mont., two black club-shaped fungi, the former sometimes two to three inches high.

In speaking of our scrub fungi we must not forget the common Jew's ear, *Hirneola auricula-Judæ*, Berk. Great quantities of it are collected at Tahiti and shipped to China where it is used for soups. It might surely be collected with advantage in both Queensland and New South Wales during wet warm weather, it is very abundant on old timber in our dense scrubs. It is said to fetch in the market when dry about six-pence a pound. Little or no care is required in drying, just placing in the sun and turning now and again for a few days. *Hirneola polytricha* is perhaps the more common in New South Wales and is quite as valuable as an esculent. Use might certainly be made of many of the larger kinds of *Polyporei* in a similar way to that in which several are used in Europe in the manufacture of chest protectors. For this purpose they are cut into thin plates dried and beaten until they become soft. The indigenous kinds likely to become useful in this respect are the large and beautiful *Polyporus lucidus*, Fr., the top of which is highly polished ; *P. senex*, Mont., a dull brown kind, but one that grows to a large size (specimens may be often met with in our scrubs from one and a-half to two feet in diameter), and *Dædalea Sprucei*, Berk., a large thick kind much softer than the last and pure white. Before concluding the few brief remarks on our fungi something should be said of those which attack our grasses. These for the most part belong to the Sub-order *Coniomycetes*, and are of quite a different character. They have the spores often naked, terminating in conspicuous threads, the perithecium when present being very delicate and evanescent. They belong also to the tribe *Pucciniæi*. The following are the plants which seem subject to them—*Fimbristylis* a small grass-like sedge on which occurs *Ustilago axicola*, Berk. This in some seasons on wet undrained land is very abundant. *U. carbo*, Tulasne, will be found on the panicles of *Aristida* a three awned speargrass. On the rice-grass *Leersia hexandra*, Sw., which is common near water-courses will be found a new species of *Thecaphora globuligera*, Berk. et Broome. The red rust

Trichobasis rubigo-vera, Lev., is common on *Hemarthria.* The last observation is very important and answers a part of the question as to whence our red rust plague is derived and where it finds a home. If an attentive observation should render as familiar with those plants it affects we might not despair of its eradication. The common black moulds *Cladosporium herbarum,* Lk., which attacks *Ischæmum* and *Paspalum,* and the *Helminthosporium ravenelis,* Curtis, which destroys the panicles of the several species of *Sporobolus* belong to the Sub-order *Hyphomycetes* or floccose fungi with simple or branched filaments and terminal spores.

Many of our readers will be familiar with the large luminous mushroom which is so common at certain seasons about the bases of old gum stumps. Until quite lately we took this fine species for *Agaricus Gardneri,* Berk., but upon careful examination Messrs. Berkeley and Broome find it a new species of *Panus* and from its luminous character have named it *P. incandescens,* it seems to have a wide range. being met with in nearly all parts of Australia. The beauty of the appearance of this kind at night cannot be exaggerated. It is a pale luminous glow which seems to permeate the whole substance except the skin of the cap. The light does not come off on the hand, neither does it emit any unpleasant smell. Some specimens found by one of us at Wallerawang on the Divide, in March 1878, were 12 inches in diameter, and gave a light which was sufficient to enable one to read a newspaper when laid upon it; the kind is said not to be poisonous. Other luminous kinds are noticed by Hooker in the Journal of Botany, 1840, Vol. II., p. 426. Probably we have five or six in Australia including the Javanese *Agricus Gairdneri.* It is as well to note that the common large luminous one is poisonous.

In conclusion we beg to call attention to the very great importance which the study of Fungi possesses for a young country like ours, which depends so much upon its agriculture. Sad experience has already taught us how its prospects may be injured by blight, mildews, smuts, rusts, &c. Little or nothing is known about the origin and spread of these terrible pests, and it is equally certain that if they were known they would in a measure be provided against. Although by many mycologists the polymorphy of these blights has been doubted, yet experience seem to have decided that a blight of one kind affecting one class of plants may be transformed into a mildew or a rust amongst cereal crops. Certain portions of England were for a long time subject to mildews and rust which farmers, it would seem, but too justly attributed to the influence of certain fungi on the Berberry shrubs near. Experiments were tried and it was found that wheat, rape, and barley sown in the neighbourhood of a berberry bush covered with a fungus called *Æcidium berberidis*, contracted rust immediately after the maturation of the spores of the *Æcidia*. The rust was most abundant where the wind carried the spores. The following year the same observations were repeated; the spores of the *Æcidium* were collected, and applied to some healthy plants of rye, after five or six days these plants were affected with rust, while the remainder of the crop was sound. In 1863 some winter rye was sown round a berberry bush, which in the following year was infested with *Æcidium*, which was mature in the middle of May, when the rye was completely covered with rust. Of the grasses near the bush *Triticum repens*, was most affected.—(See Cook and Berkeley's "*Fungi*," page 200.) It will be easily seen from this fact how important the study of fungi becomes, for in the locality referred to the destruction of the berberry bushes has been the salvation of the crop.

Before giving a list of those fungi which are known to inhabit Queensland and New South Wales, it will be necessary to explain a few technical terms for the use of students who may not have books of reference at hand when using the catalogue.

Fungi are propagated for the most part by very small bodies, called spores. These in two large divisions of the order are produced upon a fruit-bearing surface called the *Hymenium*. The gills in the common mushroom are the hymenium, the pores in *Boletus* or *Polyporus*.

Now the classification of many families depend upon the character of the hymenium, whether porous or lamellar &c. The bed of fibre from which the fungus springs is called the *mycelium*. The pileus or cap of the fungus is a term which explains itself. In the young stage many fungi are joined by the edge of the stem by a membrane which often remains when the fungus is spread out. This is the veil or *annulus*.

Fungi are divided into two great sections *Sporifera*—spores naked; *Sporidifera*—sporidia in sacs or *asci*. The first section is divided into four sub-orders which will be defined in order as they occur. The first *Hymenomycetes*, in which the hymenium is either exposed from the begining or in the course of growth.

Of this sub-order there are six tribes, viz.:—

I. Agaricini—Hymenium lamellose.

II. Polyporei—Hymenium porous or tubular.

III. Hydnei—Hymenium tuberculate.

IV. Auricularini—Hymenium even, smooth or rugose.

V. Clavariei—Hymenium superior or unfolding, fungus vertical elevate, branched, rarely lobed.

VI. Tremellini—Hymenium generally covering the whole surface, fungus lobed or discoid, gelatinous.

Agaricini.

Fungi with the hymenium formed into distinct gill-like plates the modification of which assists to distinguish the genera. In the genus *Cantharellus* the gills are replaced by veins which are branched and with an obtuse edge. In *Lenzites* the veins become hard and corky.

AGARICUS, *Linn.*

Fleshy fungi with gill plates, with or without a stem, which may be central or lateral. When no stem is present, the pileus is attached by the upper surface. The genus is divided into five natural groups, according as the color of the spores is white, pink, ferruginous, purple-brown, or black. A very large genus containing over one thousand species. The common Mushroom is the most familiar example.

Sub-genus AMANITA.

Pileus central. Young plant enclosed in a membranous free volva, through which the pileus pushes, with or without a veil. Gills not decurrent on the stem.

A. vaginatus, Bull, var. Brisbane River (Bailey), Feb. 7, 1880. Top of pileus mouse-colour and somewhat viscid, margin thin and striated or furrowed, without the scales of the allied species, stem split and portions curled giving the appearance of being scaly. Volva free, but closely appressed to stem, base bulbose.

LEPIOTA, *Pers.*

Veil simple, annular, somewhat persistent.

A. procerus, Scop., Enoggera Creek, Queensland, (Bailey)—Port Douglas (Woods).

A. Beckleri, Berk., Clarence River, N.S.W. (Beckler).

A. aspratus, Berk., Clarence River, N.S.W. (Beckler), Enoggera Creek, Queensland (Bailey).

Sub-genus OMPHALIA, *Pers.*

Pileus fleshy-membranous or when young umbilicated.

A. oniscus, Fr., Gainsford (G. Bowman).

A. umbelliferus, Linn., ? Brisbane River (Bailey).

Sub-genus PLEUROTUS.

Stem out of the centre or lateral.

A. applicatus, Batsch., Gainsford, Queensland (E. Bowman).

A. mollis, Schæff., Logan River, (Bailey).

A. Guilfoylei, Berk., Tweed River (Guilfoyle).

A. sordulentus, B. et Br., on logs Taylor's Range, Queensland, a new and beautiful species very like a *Lentinus* (Bailey).

Sub-genus FLAMMULA.

Veil fugacious, gill adnate or decurrent.

A. Baileyi, B. et Br., orange colored, on logs near Brisbane (Bailey).

A. sapineus, Fr., yellow-brown, on logs near Brisbane (Bailey).

A. picreus, Fries., Rockhampton, on dead trunks of *Macrozamia*, (Thozet).

Sub-genus NAUCORIA.

Pileus fleshy, membranous, flattish, squamulose, small; lamellæ cinnamon-colored.

A. Bowmani, Berk., Herbert Creek, Queensland (Bowman).

A. anguineus, Fries., Rockhampton (Thozet.)

Sub-genus PSALLIOTA.

Stem with a ring formed by the veil.

A. campestris, Linn., common mushroom found everywhere.

A. versipes, B. et Br., a new species found amongst the roots of Bamboo, in the Brisbane Botanical Gardens. A large species somewhat resembling *A. campestris*, but with a much thicker stipes, the gills also are fasciculated in a very peculiar manner and the whole plant has a strong smell of garlic.

Sub-genus PSATHYRELLA.

A. disseminatus, P., Enoggera Creek. (Bailey). This is a small delicate species often found in great abundance on old rubbish in damp places.

A. hiascens. Fries., Rockhampton, (A. Thozet.)

A. (*Lepiota*) ***leontoderes***, B. et Br., Gracemere O'Shanessy, F. de Thümen, publicata, deter. C. Kalcbrenner, as also the nine following.

A (*Lepiota*) ***clypeolarius***, Bull, Gracemere O'Shanessy.

A. (*Lepiota*) ***granulosas***, Fries., Rockhampton, (Thozet.)

A. (*Mycena*) ***silenus***, B. et Br , sent to Baron Mueller from North Australia by Armit.

A. (*Omphalea*) ***scyphiformis***, Fries., amongst grass, Gracemere O'Shanessy.

A. (*Pleurotus*) ***illuminans***, Muller, Rockhampton, (Thozet).

A. (*Pleurotus*) ***corticatus***, Fries., Gracemere O'Shanessy.

A. (*Hebeloma*) ***nudipes***, Fries., Gracemere O'Shanessy.

A. (*Panæolus*) ***campanulatus***, Linn., Parramatta. Jour. Linn. Soc., Vol. 16.

COPRINUS, *Persoon.*

Gill-bearing fungi remarkable for their dark spores and deliquescent pileus, gills adhering together, growth and decay extremely rapid, on dung hot-beds, some yield a very dark juice which is used for ink, and some are edible.

C. ***stercoreus***, Fr., in many parts of N. S. W. and Queensland.

C. ***ephemerus***, Fr., Bull, t. 128; Gainsford, Queensland (Bowman).

HYGROPHORUS, *Fries.*

This genus is separated from ***Agaricus*** on account of the waxy not membranous gills, and granular intermediate substance.

H. ***miniatus***, Fr., a small, beautiful deep red species very abundant in open pastures during damp weather in Queensland (Bailey)

H. ***porphyrinus***, B. et Br., pileus and stipes purple, gills white, a new species found on open pasture near Brisbane (Bailey.)

MARASIMUS, *Fries.*

Habit of *Agaricus.* Pileus fleshy or membranous, hymenium dry, gills thick, tough with acute edges.

M. confertus, B. and Br., a delicate fungus often found crowded in Queensland and New South Wales river scrubs.

M. rotula, Fries., on dead wood, Gracemere O'Shanessy.

M. rufo-pallidus, Kalchbrenner, published by F. de Thümen, Gracemere O'Shanessy.

M. rhyticeps, Kalchb., Rockhampton on stems of *Passiflora*, (Thozet.)

M. calobates, Kalchb., Rockhampton, on old leaves of *Bourgainvillea* (Thozet.)

M. aciculæformis, B. and Br., Gracemere on old decayed logs O'Shanessy.

M. primulinus, Berk., Parramatta, Jour. Linn. Soc. Vol. 16.

M. opacus, Berk. and C., Parramatta, Jour. Linn. Soc., Vol. 16.

LACTARIUS, *Fries.*

Trama vesicular, gills lactescent, whence the generic name.

L. subtomentosus, B. and Rac., Parramatta, Jour. Linn. Soc., V. 16.

CANTHARELLUS, Vide supra.

C. concinnus, Berk., Parramatta, Jour. Linn. Soc., Vol. 16.

C. cibarius, Fries., Parramatta, Jour. Linn. Soc., Vol. 16.

C. aurantiacus, Fries., Rockhampton, (Thozet.)

RUSSULA, *Fries.*

This is a genus of bright colored mushrooms. Gills brittle and entire, either white or of an apricot color, according to color of spores. Some are extremely acrid, others mild and esculent, and on the continent of Europe highly esteemed.

R. emetica, Fr., Elizabeth Bay, (Tenison-Woods) a very poisonous species.

B. rubra, Fr., Brisbane River, (Bailey).

B. fragilis, Fr., Herbert Creek, (E. H. Bowman).

LENTINUS, *Fries*.

Habit of *Agaricus*. Pileus leathery, hard. Gills tough, edges often lacerated.

L. fasciatus, Berk., a beautiful shaggy fungus on wood in dense scrubs, Parramatta (Woods), Rockhampton (Bowman), Trinity Bay and Brisbane River (Bailey). This species varies much in color, from very light to dark brown, (F.M.B.)

L. pergamenus, Fries., Gracemere O'Shanessy.

L. subundus, Berk., sent to Baron Mueller by Armit from North Queensland.

L. Lecomtei, Fr., shaggy like the last, on a shorter usually excentric stipes, Tweed River (Guilfoyle), Southern Queensland (Bailey).

L. exilis, Kl., a very beautiful cup-formed species, color light, not shaggy, Trinity Bay (Bailey), Daintree (Woods). Daintree specimen large.

L. vulpinus, Fr., Tweed River (Guilfoyle).

L. Dunalii, Fr., Trinity Bay, (Bailey).

L. cyathus, B. et Br., a very fine species. Dense scrubs, Enoggera Creek, (Bailey). New species.

L. subdulces, Berk., on logs, Taylor's Range (Bailey).

PANUS, *Fries*.

Pileus tough but fleshy, gills unequal, edges entire, acute.

P. incandescens, B. et Br., *(n. sp.)* the large luminous mushroom of Queensland and South Australia (Bailey).

P. viscidulus, B. et Br., *(n. sp.)* top of pileus somewhat of a slate color and very clammy, while fresh the gills white, on timber Brisbane River scrubs (Bailey), New South Wales (Woods).

XEROTES, *Fries*.

Gills distant, entire, obtuse, whole plant of delicate texture and dry, whence the name. On decaying logs.

X. Rawakensis, Fr., Enoggera, near Brisbane, (Bailey).
X. proximus, B. et Br., Brisbane River (Bailey).
X. fulvus, B. et Br., Enoggera (Bailey).

PAXILLUS, *Fries*.

Gills persistent, distinct from the hymenophorum.

P. Muelleri, Berk., Parramatta, Jour. Linn. Soc., Vol. 16.

SCHIZOPHYLLUM, *Fries*.

Pileus dry. Gills branched in a flabellate manner, split longitudinally.

S. commune, Fr., color of cap grey, gill brownish, very abundant ubiquitous species, on timber, Tweed River (Guilfoyle), Brisbane River (Prentice), Trinity Bay (Bailey), Daintree (Woods).

LENZITES, *Fries*.

Pileus corky. Gills firm, often anastomosing, with entire edges.

L. betulina, Fr., Main Range, Queensland (Bailey).
L. Palisotii, Fries, New South Wales (Mueller.)
L. Berkeleyi, Lév., Brisbane River (Thozet).
L. deplanata, Fr., in all the scrubs about Brisbane, very abundant and large at Maroochie (Bailey), Daintree (Woods).
L. faventinus, Cald., Enoggera (Bailey).
L. striata, Fr., on timber, Three Mile Scrub (Bailey), Port Douglas (Woods).
L. striata, var minor. Herbert's Creek, Rockhampton, Jour. Linn. Soc., Vol. 13, bot. p. 161.

Tribe POLYPOREI.

Hymenium lining the cavity of tubes or pores.

STROBILOMYCES, *Berk*.

Very like a *Boletus*. Spores globose or broadly elliptic and rough.

S. *nigricans*, Berk., Ithaca Creek (Bailey).

Boletus, *Linn.*

Hymenium tubes separable from each other as well as from the pileus. Stipites stout. Some poisonous, others thought excellent food, and preferred in some places to the Mushroom. The most poisonous kinds are said to be of a red color about the orifice of the tubes. These fungi often change color almost instantaneously upon being broken, from white or yellow to blue.

B. pachypus, Fr., forest land Brisbane River (Bailey).

B. subtomentosus, Linn , Parramatta, Jour. Linn. Soc., Vol. 16.

B. ananæceps, Berk., Parramatta, Jour. Linn. Soc., Vol. 16.

Polyporus, *Fries.*

A very large genus of pore-bearing fungi. The tubes not separating from each other, or from the pileus distinguishes this genus from *Boletus*. The species are often large, hard and beautiful, one is said to be worshiped in Guinea, and several are of commercial value in various ways.

Section Mesopus.

Stem distinct, simple, lateral or nearly central. Substance corky or fleshy.

P. arcularius, Fries, stipes central, smooth pores rhomboid. Brisbane district, very common on old timber (Bailey), Rockhampton (Bowman), Daintree and Endeavour Rivers (Woods).

P. oblectans, Berk., Herbert's Creek (Bowman).

P. Armitii, Kalchbrenner, Fragm. Fascs. xc., North Australia (Armit).

P. xanthopus, Fr., infundibuliform on yellow stems, Tweed River (Guilfoyle), Brisbane River, and Trinity Bay (Bailey), Daintree River (Woods), Cape York (E. Daemel).

P. lucidus, Fr., pileus polished, stem on one side, central, or altogether wanting, Rockhampton (Bowman), Daintree (Woods). Brisbane River, Maroochie and Trinity Bay (Bailey)

P. luteo-nitidus, Berk., Maroochie (Bailey).

P. quadrans, Berk. et Br., Enoggera (Bailey).

P. dictyopus, Rostk., on the ground Enoggera (Bailey).

Section PLEUROPUS.

Stem lateral, simple, of usually hard substance.

P. picipes, Fr., Redland Bay, Queensland (A. J. Boyd).

P. sanguineus, Fr., often in thin deep-red fan-shaped flakes. New England (C. Stuart), Parramatta (? Woolls), Tweed River (Guilfoyle), Brisbane River and Maroochie (Bailey), Daintree River (Woods).

P. luteus, Nees, very like *P. xanthopus*, but usually thicker in substance and more flabelliform, Tweed River (Guilfoyle), Brisbane River (Bailey).

P. flabelliformis, Kl., pileus dark, zonate, clothed with soft velvety hairs. Tweed River (Guilfoyle), Brisbane River, Maroochie (Bailey).

P. affinis, Fr., is a variety of the previous species.

P. cinnabarinus, Fr., pileus corky, slightly convex, somewhat zoned, hymen. scarlet, Brisbane River (Bailey), Port Douglas (Woods).

P. fuscolineatus, B. et Br., pileus thin, marked by very slender lines radiating from the centre to the edge. Brisbane River (Bailey).

P. rhipidium, Berk., small white species, Enoggera River (Bailey).

P. platotis, B. et Br., whole plant fragile, margins deeply sinuate and thick. Brisbane River (Bailey).

P. dilatatus, Berk., Tweed River (Guilfoyle).

P. (*Anodermei*) *funalis*, Fr., soft white fungus, Trinity Bay (Bailey).

P. (*Anodermei*) *corrivalis*, Berk., imbricated, somewhat conchiform Brisbane River (Bailey), Port Douglas (Woods).

P. *citro-aurantius*, B. et Br., a most peculiar kind, when dried resembling candid orange-peel, substance of fungus like that of *P. arcularius* soft leathery, the pores falling together in drying and turning a dark color, its habit is much like that of *P. corrivalis*, forming imbricate masses on wood Enoggera (Bailey).

P. *fructicum*, B. et C., a soft spongy brown fungus, on twigs of trees. Brisbane River (Bancroft), Trinity Bay (Bailey).

P. (*Plocodermei*) *rubidus*, Berk., pileus thick, pinkish. Maroochie Brisbane River (Bailey), Port Douglas and Liverpool Ranges (Woods).

P. (*Plocodermei*) *radiatus*, Berk., Taylor's Range (Bailey).

P. (*Anodermei*) *fœdatus*, Berk., pileus three inches across, one and a-half to two inches long; pores 1/96 inch in diameter. Cape York, Journals of the Linn. Society, Vol. 16.

P. (*Anodermei*) *tephronotus*, Berk., Parramatta, Journal Linnean Soc., Vol. 16.

P. (*Anodermei*) *ochroleucus*, Berk., Parramatta, Journal Linnean Soc., Vol. 16.

P. (*Anodermei*) *semidigitaliformis*, Berk., Parramatta, Jour. Linn. Soc., Vol. 16.

P. (*Pleuropus*) *rugosus*, Nees, Parramatta, Journal of Linn. Soc., Vol. 16.

P. (*Pleuropus*) *peroxydatus*, Berk., color of pileus like that of per oxide of iron. Parramatta, Journal of Linn. Soc., Vol. 16.

P. (*Placodermei*) *portentosus*, Berk., Parramatta, Journal of Linn. Soc., Vol. 16.

P. (*Placodermei*) *australis*, Fries, Parramatta, Journal of Linnean Society, Vol. 16.

P. (*Placodermei*) *incrassatus*, Berk., Cape York, Journal of Linn. Society, Vol. 16.

P. (*Resupinati*) *obliquus*, Fries., Parramatta, Journal of Linnean Society, Vol. 16.

P. gallopavonis, B. et Br., *n. sp.*, Enoggera (Bailey).

P. zonalis, Berk., on wet wood, Brisbane River (Bailey).

P. igniarius, Fr., very large, hard, brown, very common on *Casuarinas*, Queensland (Bailey), New South Wales (Woods).

P. senex, Mont., Brisbane River, Trinity Bay (Bailey), Daintree (Woods). This is one of the largest of Australian fungi.

P. melanopus, Mont., a small dark fungus, on dead trees, Taylor's Range (Bailey).

P. Persoonii, Fr., Tweed River, (Guilfoyle).

P. cinereo-fuscus, Currey, Trinity Bay (Bailey).

P. scruposus, Fr., Enoggera Creek (Bailey).

P. libum, Berk., Tweed River (Guilfoyle).

P. cichoraceus, Berk., a dark, glossy brown, velvety fungus, Brisbane River (Bailey).

P. luteo-olivaceus, B. et Br., Brisbane River (Bailey).

P. hirsutus, Fr., pileus hairy, Clarence River (Dr. Beckler), Tweed River (Guilfoyle), Brisbane River (Bailey).

P. occidentalis, Kl., a large, thin, hairy or scaly capped species of grey or brownish color. Enoggera Creek (Bailey).

P. lilacino-gilvus, P., hymenium of a beautiful pink color, Enoggera Creek (Bailey).

P. elongatus, Berk., a fragile, fan shaped, white species, New England (C. Stuart), on logs Enoggera Creek (Bailey), Maroochie (Bailey).

P. venustus, Berk., pileus very scaly, often dark, pores irregular shaped, sometimes purplish, on old timber, Enoggera Creek (Bailey).

P. Peradeniæ. B. et Br., pileus somewhat zoned, soft silky, usually lemon-colored. Pine River (Black), near Ipswich (Miss Campbell), Brisbane River (Bailey).

P. compressus, Berk., pileus somewhat scaly yellowish, thick often, found on logs in open forests, fences, &c., Brisbane River (Bailey).

P. ferruginosus, Fries. This species forms often large, close, brown patches, on old timber, Brisbane River (Bailey).

P. Broomei, Rabenh., a white species often found in patches, one foot long, and six inches wide, on logs Enoggera Creek (Bailey).

P. calceus, B. et Br., this species forms large, thin, flakes on the fallen timber, Trinity Bay (Bailey).

P. rimosus, Fries, (Mueller).

P. Floridanus, Berk., a skin-like fungus, on hard timber, Enoggera Creek (Bailey).

P. flavus, Jungh., New South Wales, (Mueller).

P. fulvus, Fries, New South Wales (Mueller).

P. biretum, Kalchb., New South Wales (Mueller).

P. vaporarius, Fries, Gracemere (O'Shanessy).

P. xerampelinus, Kalchb., (*n. sp.*) Rockhampton (A. Thozet).

P. murinus, Kalchb., (*n. sp.*) Rockhampton (A. Thozet).

P. chrysoleucus, Kalchb., Rockhampton (A. Thozet).

P. Eucalypti, Kalchb., on stems of *Eucalypts* Rockhampton (Thozet).

P. salicinus, Fries, on logs, Rockhampton (A. Thozet).

P. placodes, Kalchb., (*n. sp.*) Rockampton (Thozet.)

P. chilensis, Fries, Rockhampton (Thozet).

P. gibbosus, Nees, Rockhampton (Thozet).

P. Tricholoma, Mntg., Gracemere (O'Shanesy and A. Thozet).

P. myclodes, Kalchb., (*n. sp.*) Gracemere (O'Shanesy).

TRAMETES, *Fries.*

This is a genus very near to *Polyporus*, differing in the trama —substance separating the pores—being thick, and continuous without change from the pileus.

T. pyrrhocreas, Berk., pileus somewhat thick, banded, velvety, substance like *Amadou*. Herbert's Creek, Journ. Linn. Soc., botany, Vol. XIII., 164, 1873.

T. occidentalis, Fries, Parramatta (Moseley).

T. versatilis, Berk., Herbert's Creek. (*l. c.*)

T. mollis, Fries, Parramatta (Moseley).

T. acupunctatus, A., Herbert's Creek (E. M. Bowman *l. c.*)

T. phellinus, Berk., New England (*l. c.*)

T. devexa, Berk., often forming long strips on old timber, color various, pileus velvety, Tweed River (Guilfoyle), throughout Queensland (Bailey).

T. lactineus, Berk., New England, Journ. Linn. Soc., botany, Vol. XIII., p. 165.

T. colliculosa, Berk., New England (*l. c.*)

T. rigida, Berk., closely resembling *T. devexa*, pileus usually much wider and more hairy, Tweed River (Guilfoyle), throughout Queensland (Bailey and Woods).

T. umbrinus, Currey, Brisbane River (Bailey).

T. pictus, Berk., pileus clouded or obscurely zoned by a darker color, sometimes shortly stipitate on hard forest timber, Brisbane River (Bailey), Endeavour River (Woods).

T. perennis, Fr., a very pretty species found among grass on stony ridges about Brisbane (Bailey).

DÆDALEA, *Persoon.*

Pores often sinuous or labyrinthiform, but variable; sometimes resembling a *Lenzites*, at other times a *Tramites*.

D. tenuis, Berk., Cape York, Journ. Linn. Soc., Vol. XIII., bot. page 165.

D. Bowmani, Berk., Herbert's Creek (Bowman).

D. aspera, Fries, ? a large white species, pores large sinuous, Enoggera Creek (Bailey),

D. Sprucei, Berk., a very large, thick, white fungus, with small pores. Brisbane, and most of the South Queensland scrubs on stumps and logs (Bailey), Daintree (Woods).

D. glabrescens, Berkeley, Parramatta (Moseley).

HEXAGONA, *Fr.*

Pores usually large and angular, somewhat resembling the cells of a honeycomb.

H. tenuis, Fr., Cape York (E. Daemel).

H. polygramma, Mont., on mangroves, Trinity Bay (Bailey).

H. Muelleri, Berk., New England, Journal Linnean Society, Vol. XIII., 166.

H. tenuis, Fries, Cape York, Journ. Linn. Soc., Vol. XVI.

H. erinigera, Fries, North Australia (Armit).

FAVOLUS, *Fries.*

Pileus fleshy, flexible, hymenium reticulate, pores radiating elongated.

F. squamiger, Berk., pileus umbilicate, New England, Journal of Linn. Soc., Vol. XIII., 166.

F. cæspitosus, Berk., densely tufted, stems connected at the base, over 50 in a tuft, two inches or more high, Clarence River (Dr. Beckler, *l. c.*)

LASCHIA, *Fries.*

Pileus fleshy, but very cellular, the top sticky when fresh, hymenium reticulate, very similar to *Favolus*.

L. Thwaitesii, B. et Br., a small, white species found on the bark of *Wormia alata*, at Trinity Bay (Bailey), Maroochie (Bailey).

L. pustulata, B. et Br., on scrub logs, Enoggera (Bailey).

L. tremellosa, Fr., Tweed River (Guilfoyle).

L. cæspitosa, Berk., perhaps identical with *F. cæspitosa*, mentioned before, but the plant, never so large in Queensland as the specimens of that from the Clarence, are described in the Journal above quoted, Enoggera (Bailey). The species are very similar, and probably only forms of one.

MERULINUS, *Haker*.

Hymenium waxy, soft, formed of porous reticulations or sinuous toothed depressions. To this genus belong those fungi most destructive to timber, as dry rot &c. No species in our collection yet determined.

Tribe HYDNEI.

Hymenium not lining pores or tubes, but spread over the surface of spines or papillæ.

HYDNUM, *Linn.*

Pileus fleshy or hard, hymenium spread over the surface of awl-shaped or compressed spines that are free at the base, some species are said to be excellent when cooked.

Section APUS.

Pileus sessile.

H. Muelleri, Berk., hymenium spines yellow, long and slender, Tweed River (Guilfoyle).

H. (mesopus) nigrum, Fries, Parramatta (Mosely).

H. (resupinatum) xanthum, B. and C., Parramatta (Mosely).

H. gilvum, Berk., pileus somewhat fan-shaped, spines of hymenium somewhat acute, the whole yellow, Enoggera Creek (Bailey).

H. merulioides, B. et Br., *(n. s.)* hymenium a rich orange color, the rest white, found on the damp timber of a bridge. Ithaca Creek (Bailey.)

IRPEX, *Fries.*

Hymenium with firm coriaceous acute teeth, disposed in rows.

I. flavus, Kl., this forms large patches on old timber, is of a leathery consistence and of a beautiful yellow color, Herbert's Creek (Bowman), Rockingham Bay (Dallachy), Trinity Bay (Bailey), Daintree (Woods), near Ipswich (Miss. F. M. Campbell).

I. zonatus, Fr., Main Ranges, Queensland (Bailey).

SISTOTREMA, *Fries.*

Having the habit and appearance of *Irpex*. The gill-like teeth bearing the hymenium.

S. irpicimum, B. et Br., this new species forms large irregular patches on old timber in dense scrubs, at first sight one might mistake it for *P. Broomei*, but on examination the hymenium will be found toothed like an *Irpex*, to which it is closely allied. Enoggera Creek (Bailey).

RADULUM, *Fr.*

This genus connects *Irpex* and *Sistotrema* with *Hydnum*.

R. ? *sp. nov.*, found on an old Peach tree, Brisbane (Bailey).

PHLEBIA, *Fries.*

These are skin-like fungi found on damp timber. Hymenium sub-gelatinous, spread over persistent veins.

P. radiata, Berk., Ithaca Creek (Bailey).

AURICULARINI.

Hymenium not prickly or tubular, but forming obscure folds r even.

THELEPHORA, *Fries*,

Hymenium tough, at length rigid, costate, striate, or papillose.

T. pedicellata, Schewin. This forms lichen-like patches on the boughs of scrub trees and bushes, and is of a brown color, Enoggera Creek (Bailey).

T. dendritica, Fr., Clarence River, Journ. Linn. Soc., Bot., Vol. XIII., p. 167.

T. congesta, Berk., Rockhampton (Bowman).

T. lamellata, B. et C., a very large goblet-formed fungus found on old logs, Maroochie, Queensland (Bailey).

Cladoderis australis, Kalchb., New South Wales, (Mueller).

STEREUM, *Fries*.

Pileus coriaceus often soft, velvety, hymenium even, stiff fungus whence the name from *stereos* stiff, Gr.

S. nitidulum, Berk., in wet seasons this species often attacks the roots of grass in damp localities. The fungus is of itself very pretty, being in the form of cups, zonate and glossy, Brisbane River (Bailey).

S. elegans, Fr., Queensland (Bowman).

S. lobatum, Fr., pileus rigid, undulate, velvety above the hymenium of a light brown, common on the dead timber of scrubs, Cape York (Daemel), Daintree (Woods), Brisbane River (Bailey), Tweed River (Guilfoyle), New England (C. Stuart).

S. hirsutum, Fr., pileus strigose-hirsute, often zoned, hymenium bright yellow, New England (C. Stuart), Brisbane River (Bailey).

S. Schomburgkii, Berk., Maroochie, on old timber (Bailey).

S. prolificans, Berk., Cape York, Parramatta (Moseley).

S. illudens, Berk., Parramatta, Journal Linn. Soc., Vol. 16.

S. radiato-fissum, B. et Br., pileus glossy, hairy, whole plans cut to the base into digitate lobes, on logs Taylor's Range (Bailey), a new and beautiful species.

S. ostrea, Nees., Rockhampton, (Thozet.)

S. leuteo-badium, Fries., New South Wales (Mueller).

S. striatum, Fries., New South Wales (Mueller).

HYMENOCHÆTE, *Lev.*

Coriaceous, dry. Hymenium even, beset with short, stiff, colored bristles.

H. cacao, Berk., a thin skin-like fungus, mostly found on the small branches of trees, Brisbane River (Bailey).

H. rigidula, Berk., New South Wales (Mueller.)

H. tenuissima, Berk., Brisbane River (Bailey), we find no difference in these two *Hymenochæte*, they are beautiful forms of fungi.

CORTICIUM, *Fries.*

These fungi are distinguished from *Stereum* and *Thelephora* by their more tender hymenium, they are usually found on the bark of trees, hence the name from *cortex* bark.

C. nudum, Fries., on orange trees, Rockhampton (Thozet).

C. læve, Fr., membranous, smooth, hymenium pinkish, Brisbane River (Bailey).

C. incarnatum, Fr., somewhat flesh-colored, skin-like patches on bark of scrub trees, Brisbane River (Bailey).

C. olivaceum, Fr., on old bamboo Brisbane (Bailey).

C. arachnoideum, Berk., coating the twigs of scrub trees, Brisbane River (Bailey).

C. cæruleum, Fr., Clarence and Tweed Rivers (Guilfoyle).

DICTYONEMA, *Persoon.*

Hymenium breaking up into little fragments so as to exhibit the appearance of little parasitic *Pezizæ*.

D. æruginosum, Nees., Rockingham Bay, (Dallachy).

GUEPINIA, *Fries.*

Pileus cartilaginous, or almost gelatinous, folded or twisted. Hymenium distinct, inferior or at first superior, unchanged, persistent, bright colored fungi.

G. spathularia, Fr., small orange-yellow fungus on fences, Herbert's Creek, (Bowman), Trinity Bay and Brisbane River (Bailey), Endeavour River (Woods).

HYPOCHNUS, *Fries.*

H. rubro-cinctus, Phr., on bark of trees Brisbane River (Bailey).

AURICULARIA, *Fries.*

Hymenium irregularly and distantly folded, gelatinous when wet, different in substance from the pileus.

A. lobata, Sommf., on damp logs in thick scrub Brisbane River (Bailey).

A. mesentrica, Bull, Enoggera Creek (Bailey).

A. albicans, A., a brilliant species, Herbert's Creek, Journal of Linn. Soc., Botany, Vol. XIII., p. 170.

Tribe CLAVARIEI.

Usually erect fungi, elavate or terete. Hymenium extending over the apex of the plant, even or wrinkled.

CLAVARIA, *Linn.*

Branching erect fungi, or various colors and very fleshy.

C. botrytis, P., Parramatta (W. Woolls), New England (C. Stuart)

C. argillacea, Fr., var. Brisbane River (Bailey).

C. stricta, P., Toowoomba (C. H. Hartmann).

C. rugosa. Bull, Brisbane River (Bailey).

C. ? fastigiata, DC., Brisbane River (Bailey).

C. flava, Schæff., Parramatta, Journ. Linn. Soc., Vol. 16.

C. aurea, Schaff., Parramatta, Jour. cit.

LACHNOCLADIUM, *Berk.*

L. furcellatum, Lév. This is a most beautiful coral-like fungus found on old scrub timber in the tropics in large masses, color white or cream, Trinity Bay (Bailey)'

TREMELLA, *Fries.*

Gelatinous fungi of various forms, often lobed.

Tremella lutescens, Persoon, Parramatta, (Mosely).

HIRNEOLA. *Fries.*

Gelatinous cup or ear-shaped, horny when dry.

H. auricula-Judæ, Berk., Jew's ear; this species is largely used in China as food.

H. polytricha, Mont., differing from the last in the hairy pileus. Is the common form in Port Jackson, and all along the East Coast.*

H. rufa, Berk., Cape York, (Mosely), Journ. Linn. Soc., Vol. 16.

Sub-order II., GASTEROMYCETES.

Hymenium concealed within the substance of the plant, exposed only by the rupture or decay of its walls (peridium) consisting of closely packed cells, of which the fertile bear naked spores on distinct spicules.

Tribe HYPOGÆA.

Hymenium resembling the crumbs of bread, sub-terranean in habit, some have a distinct peridium while others are totally destitute of any covering. They differ from real truffles in the fruit consisting of naked spores. This tribe of fungi are most anxiously inquired after by European Mycologists from Australia but as yet few have been collected.

HYDNANGIUM, *Wallr.*

Peridium fleshy or membranaceous, sterile, base none. Trama vesicular. Cells at first empty, then filled with echinulate spores.

H. australiense, B. et Berk., (*n. sp.*) a redish, fleshy puff-ball-like fungus, very rare, Sandy Creek, Taylor's Range (Bailey).

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* *Hirneola polytricha*, is also found in New Zealand where it became an article of export for the Chinese market. It is used to thicken soup.

Tribe PHALLOIDEI.

Young plants enclosed in a gelatinous globular volva, which bursting allows the plant to assume its ultimate form; hymenium melting down with the spores into an olivaceous, often fœtid semifluid mass.

DICTYOPHORA, *Fries.*

Spores enclosed in a kind of net work.

D. multicolor, B. et Br., (*n. sp.*) this remarkably handsome fungus attains the height of six or eight inches, is richly colored, and adorned with a long netted veil, reaching half-way down its stipes. Plant rare as yet, only having been met with in one locality, Kedron Brook by Mrs. England.

D merulina, Berk., Rockingham Bay, Journ. Linn. Soc., Vol. 13, Bot. 172.

PHALLUS, *Linn.*

Pileus conical, perforated at the apex, deeply pitted.

P. calyptratus, B. et Br., part of volva adhering to the pileus gives a cap-like appearance to this fungus. Amongst grass near Brisbane (Bailey).

P. , ? *sp. n.*. pileus one and a-half inch broad, orange, stipes lemon, and volva white, scent heavy, but not very disagreeable, Brisbane (Thos. Weedon).

ASEROE, *Labill.*,

Pileus divided at the summit into radiating, simple or forked arms.

A. rubra, Labill., pileus red, resembling somewhat in form a star-fish, New England (C: Stuart), Brisbane River (Mrs. Coxen).

CLATHRUS, *Mich.*

Beautiful netted fungus resembling *Ileodictyon.*

C. crispus, Turp., amongst grass, Rockingham Bay, Journ. Linn. Soc., Bot. Vol. XIII., p. 172.

C. pusillus, Berk., Wide Bay (Dr. E. F. Parker).

ILEODICTYON, *Tulasne.*

Pileus forming a globose network with soft corrugated branches.

I. gracile, Berk., Net-ball fungus, Brisbane River (Bailey).

Tribe TRICHOGASTRES.

Usually globose dry fungi, Hymenium enclosed in a single or double peridium (coat), drying up into a dusty mass of microscopic threads and spores. Puff-balls.

GEASTER, *Micheli.*

Peridium double, persistent, the outer splitting from the base to the apex into segments, which spread out like a star; the nucleus bursting by a pore at the apex.

G. minimus, Schw., small earth star, Rockampton (Bowman), Parramatta, (Mosely).

G. saccatus, Fr., Clarence River, (Dr. Beckley), Mount Gowrie (Bailey).

G. striatus, DC., var. minor Mount Gowrie (Bailey).

G. lageniformis, Vitt., Brisbane River (Bailey).

BOVISTA, *Dillenius.*

Large puff-balls. Peridium double, persistent forming a bark-like paper, which shells off from the nucleus—capillitium. The nucleus composed of a mass of brown filaments, and pedicelled spores.

B. lilacina, Mont. et Bert., dark puff-ball, top often flat. Enoggera and Cunningham's Gap, Queensland (Bailey).

B. Muelleri, Berk., Herbert's Creek (Bowman).

LYCOPERDON, *Tournefort.*

Peridium often broken into scales or warts. Nucleus soft and dense, compact at the base.

L. pusillum, Fries, Barron River (Bailey).

L. gemmatum, Fries, a soft brownish puff-ball, found in scrubs. Logan River (Bailey).

L. brasiliensis, Fr., a small species found on old timber in scrubs Brisbane River, is perhaps this species (Bailey).

SCLERODERMA, *Persoon.*

Somewhat globose, sessile or stipitate. Peridium firm, hard with an inner bark, bursting irregularly. Spores large granulated.

S. bovista, Fr., common in Southern Queensland, (Bailey).

S. pandanaceum, Muell., Rockingham Bay (J. Dallachy).

S. geaster. Fr., Herbert's Creek, Journal of Linn. Soc., Bot., Vol. XIII., p. 171.

S. strobilinum, Kalchb., Rockhampton (Thozet).

MYCENASTRUM, *Desv.*

Peridium thick, like shoe-leather, splitting at maturity in a somewhat stellate manner.

M. corium, Berk., a large hard puff-ball, Mount Gowrie, Darling Downs (Bailey).

POLYSACCUM, *Desv.*

A genus of hard puff-balls. within the outer peridium containing a multitude of small peridia.

P. olivaceum, Fr., ridges about Brisbane (Bailey), spores yellow. Liverpool Plains, Murrurundi, Bathurst (Woods).

P. pisocarpium, Fr., Brisbane River (Bailey), spores brown-ferruginous.

CRUCIBULUM, *Tulasne.*

Habit of *Cyathus*. Peridium globose at first, afterwards cupped and obconic, of a uniform spongy, fibrous fitted consistence. Orifice closed by a flat furfuraceous cover of same color, sporangia plane attached to a nipple-like tubercle by a long cord.

C. vulgare, Tul., peridium dirty-yellow, finally white spores, minute, ovate, Gracemere, Rockhampton (O'Shanessy).

MYXOGASTRES.

Usually small fungi, form various, pulpy while young. Peridium usually globose, single or double, containing a dusty mass of flocci, mixed with spores.

Didymium, *Schrader*.

Peridium scaly, mealy or tomentose, bursting irregularly.

D. farinaceum, Fr., on decaying fruit, Brisbane (Bailey).

Stemonitis, *Gleditsch*.

Peridium very delicate, single and deciduous, filled with a beautiful network of threads, connected with the stem and penetrating more or less the whole mass.

S. fusca, Roth., a common kind on damp timber, grows in minute tufts of cylindrical peridia, supported on dark bristle-like stems, these are often persistent after the network has fallen away, Brisbane Scrubs (Bailey), S. Tasmania (Woods).

Physarum, *Pers*.

Peridium bladdery, mostly stipitate and subglobose.

P. nutans, P., peridium white, stem red, Crocodile Creek, Journ. Linn. Soc., XIII., p. 172.

Arcyria, *Hill*.

Peridium fugacious except a small portion at the base, cylindrical net-like fungus.

A. nutans, Fr., pale-yellow, nodding net fungus on wood, Brisbane Scrubs (Bailey).

A. cinerea, Fr., grey net fungus on wood, Brisbane Scrubs (Bailey)

A. punicea, Pers., dull purple net fungus, on wood, Brisbane Scrubs (Bailey).

Tribe Nidulariacei.

Peridium of various form and bursting at the apex horizontally containing separate sporangia, in which the spores are formed.

Cyathus, *Persoon*.

Fungi like diminutive birds-nests. Peridium of thin closely connected membranes, at length bursting at the apex, and the orifice closed by a white membrane. Sporangia plane, umbilicate attached by an elastic cord to the peridium.

C. Lesueurii, Tul., on dung Parramatta (Woolls).
C. intermedius, Tul., Herbert's Creek, Queensland, (Ed. Bowman).
C. campanulatus, Corda., Brisbane (Bailey).
C. fimetarius, DC., on horse dung, Brisbane River (Bailey).

Sub-order III.—COMOMYCETES.

Minute fungi, including the rusts &c. Hymenium 0. Spores abundant, conspicuous, often large, surrounded by a perithecium or naked, terminating in conspicuous threads. Threads often arising from a creeping mycelium. Peridium—perithecium—when present very delicate and evanescent. In this suborder will be found the numerous parasitic species, which affect the living organs of plants and cause such mischief to corn and other crops by exhausting the energies of the mother plant, and thus preventing the full development of the seed &c.

Tribe SPHÆRONEMEI.

Perithecium more or less distinct.

PHOMA, *Fries*.

A minute fungus, forming pustules on wood, leaves, &c. Perithecium subglobose or punctiform, discharging minute simple spores by a small orifice at the apex.

P. rosarum, Dur. et Mont., on rose aculei, Bulimba, Brisbane River (Mrs. C. Coxen).

TORULACEI.

Perithecium altogether wanting, spores compound, moniliform or raising from repeated division—rarely reduced to a single cell. Mycelium scarcely apparent.

TORULA, *Pers*.

A fungus forming compact, thick, beds on the leaves of plants.

T. herbarum, Lk., on *Acacia phyllodia*, Brisbane River (Bailey).

Bactridium, *Kunze.*

This plant consists almost entirely of oblong, septate, hyaline spores, which radiate from a little dot-like receptacle.

B. flarum, Kunze, on fig bark, Brisbane Scrubs (Bailey).

Pucciniæi.

Parasitic on living plants. Peridium 0. Spores producing secondary spores in germination, usually oblong and septate.

Puccinea straminis, Tuck., New South Wales (Mueller).

P. chondrilla, Corda, New South Wales (Mueller).

Uredo, *Léveillé.*

Minute epiphyllous fungi. Receptacle formed of several superimposed irregular cells, each containing a single, simple, sessile, or very shortly stalked spore.

U. maydis, DC., on leaves of Maize, Brisbane River (Dr. Bancroft)

Thecaphora, *Fing.*

Spores oblong or subglobose, smooth or echinulate, agglomerated together, few or many with more or less angular masses, enclosed in cysts.

T. globuligera, B. et Br., *n. sp.*, on *Lcersia hexandra*, Brisbane River (Bailey).

Trichobasis, *Léveillé.*

Spores free; attached at first to a short peduncle, which at length falls away.

T. rubigo-vera, Lév., on *Hemarthria compressa*, Brisbane River (Bailey). The red rust or farmers greatest plague; spots or heaps oval, scattered, mostly on the upper surface; epidermis at length bursting longitudinally, spores subglobose, redish-brown.

Melampsora, *Cast.*

Spores of two orders, crowded into a dense, compact mass, with or without a covering, wedge-shaped.

M. phyllodiorum, B. et Br., on *phyllodia* or *Acacia*, Brisbane River (Bailey).

USTILAGO, *Link.*

Minute fungi, deeply seated in the tissues of the plants they infest. Spores simple, arising from delicate threads or produced in a form of closely packed cells, that break up into a powdery mass.

U. carbo, Tul., on Western Queensland specimens of *Aristida* (Bailey), var. *bromivora*, on *Bromus arenarius*, Murray River Journal of Linn. Soc., Bot., XIII., 174; var. *columellifera*, Tul., Rockhampton, Queensland (*l. c.*)

U. avicola, Berk., on *Fimbristylis*, Brisbane River (Bailey).

U. segetum, Ditm., corn smut produced on the receptacle and rhachis; epidermis soon ruptured; spores loose, minute globose, black, on ears of wheat, Darling Downs, Queensland (Bailey).

U. emodensis, Berk., on *Polygonum*, Brisbane River (Dr. Bancroft).

U. bullata, Berk., forming long spots on the inflorescence of grasses Murray River Journal of Linn. Soc., Bot., XIII., 174.

TILLETIA, *Tul.*

Spores spherical, reticulated, proceeding from delicate branched threads.

T. caries, Tul., spores large, black, spherical, filling the grains of wheat with dark-colored fetid spores: Bunt., Darling Downs (Bailey).

ÆCIDIACEI.

Peridium distinctly cellular, mycelium traversing the tissues of living plants.

ÆCIDIUM, *Persoon.*

Peridium membranous, with lacerated reflected orifice. Spores concatenate, collected into sori.

Æ. apocynatum, Schwein., on leaves of *Tabernæmontana*, Brisbane Scrubs (Bailey).

CRONARTIUM, *Fries.*

Spores contained in a peridium, bursting by a regular or irregular apical orifice. Perfect spores produced in a columnar, cellular body called the ligule rising out of the centre. The most perfect form of structure in the family.

C. asclepiadeum, Fr., Darling Downs (H. Law.), on *Jacksonia scoparia.*

Sub-order IV.—HYPHOMYCETES.

Filamentous or floccose fungi. Filaments naked, simple or branched, free or united below so as to form a distinct stem with free branches. Spores terminating the filaments.

Tribe STILBACEI.

Receptacle globose; spores minute, involved in gluten, stem compound.

STILBUM, *Tode.*

Stalk solid, heads deciduous, gelatinous, spores minute.

S. aurantiaceum, Berk., on *Laportia gigas*, Enoggera Scrubs (Bailey)

S. cinnabarinum, Mont., on bark, Trinity Bay (Bailey).

FUSARIUM, *Link.*

A form of mould which spreads beneath the cuticle of the plants upon which they grow in gelatinous spots. One species is most destructive to the Mulberry, another affects the Rye in some seasons in England, these have as yet not been found in Australia.

F. rubicolor, B. et Br., a species found on the Eucalypt leaves its presence is at once detected by the blotches of red which it forms, Brisbane River (Bailey) *n. s.*

ILLOSPORIUM, *Montf.*

Receptacle obscure; spores irregular, falling away like meal.

I. flavellum, B. et. Br., a yellow species often seen on Lichens, Brisbane River (Bailey) *n. s.*

Tribe DEMATIEI.

Filaments free, more or less corticated and carbonized. Spores often compound and cellular. Black Moulds.

CLADOSPORIUM, *Link.*

Filaments of mycelium divided into short branches, bearing short 1—septate deciduous spores.

C. herbarum, Lk., mycelium dense dark, filaments pellucid. Spores olive. The ubiquitous black mould on every thing, frequently covering the inflorescence of *Ischæmum australe* in damp underground localities in Queensland (Bailey).

C. papyricola, B. et Br., on wall-paper, Brisbane (Bailey) *n. sp.*

HELMINTHOSPORIUM, *Link.*

Like *Cladosporium*, threads less carbonized. From the mycelium arise rigid erect, jointed threads, of a dark nearly black color, rather paler at the apex, spores usually produced from the apex.

H. Ravenelii, Curtis, on various species of *Sphorobolus*, Brisbane River (Bailey).

Tribe MUCEDINES.

Filaments not coated with a membrane, distinct, white or colored. Spores simple. Blue mould.

ASPERGILLUS, *Mich.*

Threads jointed, swollen at the apex and there studded with radiating cells, each of which produces a necklace of spores.

A. glaucus, Lk., the common species ; spores globose, echinulate often on other fungi, Brisbane (Bailey).

CIRCINELLA, *Fries.*

C. umbillata, Van. Tieghem and Le Monmèr, var. *Moreliæ*, B. et Br., Brisbane, on dung of carpet snake kept in a box at the Queensland Museum (Bailey, *s. n.*)

VERTICILLIUM, *Link*.

Little moulds known by their distinctly woolly branches, at the apex of which are the spores.

V. eximium, Berk., a very beautiful species found on *Clavaria* at Parramatta by W. Woolls.

OIDIUM, *Link*.

This genus is considered by some to be an early stage of some Erysiphe.

O. Tuckeri, Berk., Vine mildew.

O. erysiphoides, var. *cucurbitarium*, Spitzenberger. This form is in some seasons very destructive to Melons, Vegetable Marrows, &c. Both about Brisbane.

SPORIDIIFERA.

Having the spores or reproductive bodies contained in asci or bags.

Sub-order V.—ASCOMYCETES.

Fruit consisting of asci, containing sporidia, and springing from a naked or enclosed nucleus or hymenium, which is often spread over a receptacle.

HELVELLACEI.

Substance soft, fleshy or waxy. Hymenium more or less exposed.

MORCHELLA, *Dill*.

Head deeply pitted, naked, supported on a peduncle. The depressions are sometimes regular, but occasionally they assume the appearance of furrows with wrinkled interstices.

M. semilibera, DC., Clarence River, Journal of Linnean Society, Vol. XIII., Botany, page 175.

PEZIZA, *Dillenius*.

Cup-shaped fungi. Receptacle fleshy or sub-fleshy, at first closed, then open. Hymenium persistent. Asci distinct, fixed, mixed with paraphyses, elastically ejecting the spores. A very large and beautiful genus, found on dung, rotten wood, &c., &c., at first sight one might mistake these plants for the apothecia of Lichens.

P. confusa, Fr., on damp earth Brisbane River (Bailey).

P. (*Cupularis*) *vinosa-brunnea*, B. et Br., *n. sp.*, on burnt earth, Brisbane River (Bailey).

P. (*Geopyxis*) *cinereo-nigra*, B. Br., Redlands Bay, Queensland (A. J. Boyd).

P. (*Lachnea*) *scutellata*, Linn., on Pine bark (Bailey).

P. coprogera, B. Br., on dung Brisbane River (Bailey), *n. s.*

P. (*Humaria*) *scatigena*, Berk., on cow-dung, Ithaca Creek (Bailey)

CENANGIUM, *Fries.*

Form of *Peziza*, but firm, tough and coriaceus. Receptacle or cup closed, opening late. Hymenium smooth persistent.

C. lichenoideum, B. et Br., it forms dense masses of ashy-gray cups, which are stipitate half in first line, broad resembling a lichen in appearance, Ranges of Trinity Bay (Bailey).

PHILLIPSIA, *Berk.*

This is nearly allied to *Peziza*, but Messrs. Berkeley and Broome have found it to differ so far as to have founded a new genus upon it, the characters of which are not as yet published.

P. subpurpurea, B. et Br., *n. s.*, on rotten timber in scrub near Enoggera dam (Bailey), a very beautiful fungus of a rich purple color.

HELOTIUM, *Fries.*

This genus differs from *Peziza* in its disc being open from the first, not closed in early growth as in that genus.

H. terrestre, B. et Br., *n. s.*, on damp earth, Taylor's Range near Brisbane (Bailey).

Tribe PHACIDIACEI.

Perithecium coriaceous or carbonaceous; outer coat or perithecium bursting and exposing the disc, which is surrounded by an obtuse or inflected margin.

RHYTISMA, *Fries.*

Perithecia confluent, wrinkled, stroma thin.

R. hypoxanthum, B. et Br., *n. s*, on leaves of *Cudrania javanensis* Brisbane River (Bailey). This fungus forms thick yellow patches, dotted with black, on the foliage of the above rambling shrub.

ASTERINA, *Léveillé.*

Minute flattened epiphyllous fungi. Perithecia fragile, formed of a fimbriated mycelium. Asci perfect.

A. Baileyi, B. Br, new species on leaves of *Hakea lorea*, Springsure (Bailey), Burnet River (Dr. Bancroft), Maroochie (Bailey).

A. pelliculosa, Berk., on *Trema aspera* leaves, Maroochie (Bailey).

SPHÆRIACEI.

Perithecium carbonaceous or membranous, pierced at the apex. Hymenium diffluent. Asci usually springing from its walls.

HYPOCREA, *Fries.*

Fleshy or gelatinous, horizontal fungi, growing on wood &c. Perithecia tender, hyaline or colored. Sporidia indefinite.

H. membranacea, B. et Br., *n. s.*, on wood, Brisbane scrubs (Bailey)

XYLARIA, *Fries.*

Club shaped, somewhat corky, often friable fungi, usually distinctly stipitate, covered with a rufous or black bark. Perithecia crowded on the surface of the receptacle. Sporidia eight.

X. pileiformis, Berk., on wood, Enoggera Creek (J. R. Mair).

X. tabacina, Kick. New South Wales (Mueller).

X. polymorpha, Fr., Tweed River (Guilfoyle), Brisbane Scrubs (Bailey).

X. hypoxylon, Ehr., Herbert's Creek (Bowman)

X. rhytidophlæa, Mont., Enoggera (Bailey).

HYPOXYLON, *Bulliard.*

Characters of *Xylaria* but horizontal. Stroma not confluent with the substance of the plant on which it grows.

H. concentricum, Fries, large blackish subglobose, concentrically zoned within, throughout Queensland (Bailey).

H. rubicosum, F. et Mont., Brisbane River on timber (Bailey).

H. rutilum, Tulasne, on old wood, Rockhampton (Thozet).

PORONIA, *Fries.*

Body cup-shaped, in which the vertical perithecia are immersed.

P. œdipus, Montagne, Gracemere (O'Shanessy).

H. angolense, Welwitsch et Currey, on logs, Ranges of Trinity Bay (Bailey).

H. cetrarioides, Welwitsch et Currey, Ranges, Trinity Bay(Bailey). These specimens were the first found with mature fruit.

H. cretaceum, B. et Br., *n. sp.*, on logs, Ranges, Trinity Bay (Bailey), This fungus while fresh is pure white, globose or sub-globose, somewhat stipitate, one to two inches high. The interior substance is composed of broad, flaky, woody, but fragile strata, radiating from the stem to the outer surface, of a pale cork-color.

NECTRIA, *Fries.*

Small fungi, on wood bark &c. Perithecia free, seated on a mycelium, thin, rarely thick, vertical, brightly colored. Sporidia eight, translucent.

N. coccinea, Fr., on bark, Brisbane River (Bailey),

SPHŒRIA, *Haller.*

Stroma 0, or spurious, and formed of mycelium. Perithecia various, vertical, firm, black or dark, often with a bark. Asci perfect. Sporidia eight.

S. (Subtecta) polyascia, B. et Br., on bottle gourd. This is a new species and not yet described, so the name may not be retained but is mentioned here to notice the species which forms large black patches on gourds if left on the field.

SPHÆRELLA, *De Not.*

Perithecia membranaceous, immersed or semi-immersed, scarcely papillate, sporidia oblong, two or more celled, rarely simple; hyaline pale or colorless.

S. destructiva, B. et Br., a black or brown spot-like fungus, very destructive to Lucerne on the Brisbane River (Bailey).

PERISPORIACEI.

Perithecia free, subglobose, always closed, except when decaying membranous or carbonaceus. Nucleus never diffiuent. Asci springing from the base.

MELIOLA, *Fries.*

Perithecia carbonaceus, fragile, without a pore, developed from a strigose mycelium. Asci broad. Sporidia few, large.

M. amphitricha, Fr., a thready black fungus, often found on the leaves of scrub shrubs, Brisbane River (Bailey).

M. tetraceræ, F. v. M. and Thümen, New South Wales.

PHYSOMYCETES.

Filaments free or slightly matted, bearing vesicles which contain indefinite sporidia.

ANTENNARIEI.

Filaments black, matted, often moniliform.

ANTENNARIA, *Link.*

Black fungi, consisting of black jointed, moniliform filaments, bearing here and there spore-cases full of granules.

A. , allied to *A. semiovata*, Berk., Brisbane River (Bailey). This is the black fungus which thickly coats the leaves of plants.

MYCELIA.

Rhizomorpha Harrimanni, Sow. This is the mycelium of different species of *Xylaria*. It may often be noticed quite coating the logs in dense scrub, giving to them the appearance of being covered with the skin of some shaggy animal.

Xylostroma giganteum, Sow., is another mycelium, found in old timber, this can often be obtained in very large flakes in consistency it resembles wash leather, but is usually of a pure white.

Addenda.

Podaxon pistillaris, Fries, North Australia (Armit).

Mutinus papuasius, Kalchb., Rockhampton, (Thozet).

Tulasnodea leprosa, Kalchb., Gracemere (O'Shanessy).

Sorosporium eriachnei, Thümen, New South Wales (Mueller).

Sporotrichum densum, Link., New South Wales (Mueller).

Bisporum monilioides, Corda, New South Wales (Mueller).

Hymenangium Moselei, Berk. and Br., Parramatta (Moseley).

Sepedonium, Berk., found in old *Boleti* composed of loose branched threads with large echinate spores at tip.

S. chrysospermum, Link., Parramatta (Moseley), see Jour. Linn. Soc., Vol. 16.

DESCRIPTION OF A NEW SPECIES OF OLIGORUS FROM QUEENSLAND.

BY E. P. RAMSAY, F.L.S., &c., CURATOR OF THE MUSEUM, SYDNEY.

Plate IX.

OLIGORUS TERRÆ-REGINÆ, *sp. nov.*

D. 11/15. P. 18. A. 3/8.

The head compressed and broad in front, its length equal to the extent of the spinous dorsal, from the base of first to the end of the last spine; and one-third of the total length without the caudal. The height of the body is contained three and two-thirds in the total length (s. c.). The diameter of the eye is one-tenth of the length of the head, and is situated close to the front, being only one-fifth of its diameter from the margin of the forehead. Nostrils large, close to the eye. A strong blunt spine on the point or hinder angle of the operculum, reaching to beyond the base of the pectorals, another flat, well-developed spine above it and a little in front of it. The hinder margin of the preoperculum rough, irregularly and coarsely serrated; the lower margin wavy and irregular, somewhat smooth. Teeth viliform (no canines) in both jaws, and on a narrow lanceolate band on either side, of the palate; none on the tongue; mouth oblique, the length of the upper jaw equal to the width across the mouth, lower jaw the longest. Scales small, narrow, oblong, strongly compressed one against the other, from 120 to 130 on the lateral line, 16-17 scales between the lateral line and the fifth dorsal spine. Scales on the head, cheeks, operculum and preoperculum. Branchiostigals seven. Pectoral and caudal fins large, rounded, spotted with blackish, the spinous portion of the dorsal, as measured above, equal to the length of the head; the first and second spine shorter than the third, the eleventh the longest; the soft dorsal is well-developed, higher than the last of the spinous portion, and extends almost to the caudal, the membrane indistinctly spotted with blackish.

The general colour is of a rich brown, shaded with purplish-brown on the back, a few indistinct (when dead) transverse almost black marks on the sides. The total length with caudal, of the type specimen is six feet; the height of the body, behind the ventrals, sixteen inches; diameter of the eye 2·2 inches; the third dorsal spine 3·4 inches, the last 4·5 inches; extent of the spinous dorsal at base 19·5 inches; the longest ray of the soft dorsal 7·2 inches; first ray 6·7 inches, the last 3·8 inches. Width of the pectoral fins 9 inches, length 11 inches; width (transverse) of the caudal 14·5 inches, length centre ray 10·5. The length of the head to the end of the spine on the operculum is 22 inches.

The size to which this species attains, exceeds that of any other known. It is found at the mouths of several of the northern rivers and inlets of the Wide Bay district in Queensland; it was found to be plentiful at the mouth of the Burrum River, about twenty miles from Maryborough, Queensland, and first brought under my notice by my brothers, who obtained many of immense size at that place in 1870. The present specimen was forwarded to me in the flesh by an unknown accquaintance, a few days ago from Brisbane, to whom I take the present opportunity of expressing my sincere thanks. It has been beautifully mounted by Mr. J. A. Thorpe, the Museum Taxidermist, and is now on exhibition in the Australian Museum.

I have compared this new species with all the Australian species previously known and also with the *Oligorus (Hectoria) gigas* of Owen, from all of which it is distinct.

My brother, Mr. J. S. Ramsay, informs me that he has caught the same species in sea-water off Frazer's Island, also at Traviston and that they ascend the Mary River into brackish water near the township, where a specimen said to weigh three cwt. was caught some time ago. In the fresh-water of the Mary River and in Tinnana Creek, one of its tributaries, Cod of apparently the same species are occasionally taken. During a recent excursion to Frazer's Island large specimens were hooked which resisted all the efforts of two strong men to land them, and being made fast finally broke away. One fish landed about 4·5 feet long, weighed 160 pounds, and remains of another 10 feet long were found on the beach.

NOTES ON GALEOCERDO RAYNERI, WITH A LIST OF OTHER SHARKS TAKEN IN PORT JACKSON.

BY E. P. RAMSAY, F.L.S., &c., &c.

Plate IV.

When I prepared the sketches for the plates which accompany these few remarks, I was under the impression that this was a new species of *Thalassorhinus*, but subsequently found it described under the above name, indeed the genera *Galeocerdo* and *Thalassorhinus* are almost identical. The description given in Mueller and Hénle of *Thalassorhinus platyrhynchus* almost agrees with the present species.

A large number of Sea Sharks have lately been captured in Port Jackson and among them three of the present species, which has not been previously recorded from this locality; the largest specimen I have seen, measured in the flesh 12 feet, the present specimen 11 feet 4 inches to the centre of the caudal fin. The rounded parabolic form of the head, the form of the tail and shape of the teeth, will at once distinguish this species from all others known at present in these waters.

The following are the measurements of a male taken among the shipping in Port Jackson:—Total length 11 feet 4 inches. From the outer edge of the snout to the first dorsal 3 feet 6 inches. Length of the first dorsal 14·15 inches, its width at base 11 inches. Length of pectoral 19 inches, width 11 inches; width between the eyes 16 inches, from a line between the eyes to the snout 8 inches, width between the nostrils 7 inches, a long labial fold above the mouth, shorter and wider below, extending round the angle of the mouth; a deep pit at the root of the tail above and below, a narrow erect ridge between the dorsals.

The color is, above bluish-grey, below silvery-white. Teeth in eleven rows—the central ones above and below very small—oblique, with a large and strongly serrated, lateral, external lobe pointing outwards; the base broad, in form somewhat triangular. The spiracle is conspicuous, it is a narrow, curved slit, three-quarters of an inch long, situated a little below and behind the eye. The claspers are long, round, comparatively short for the size of the fish, with an oblique, curved, linear groove. The snout is as broad as long, the nostrils situated near the mouth.

Port Jackson and the waters of the adjacent Coast abound in Sharks of a large size and of great beauty.

It may be interesting to note some of the species with which we are blessed, I therefore give the following list of those recently obtained in Port Jackson alone, with the lengths of some of the largest:

Carcharias macklotii ..	..Length	3ft.
,, *gangeticus*	,,	3ft.
,, *brachyurus*	,,	12ft.
Galeus australis	,,	5ft. 7in.
Galeocerdo rayneri	,,	11ft. 6in. and 12ft.
Zygæna leuwinii *..	,,	5ft.
Lamna glauca	,,	7ft. 6in.
Carcharodon rondeletii	,,	10ft. 10in.
Odontaspis americanus †	,,	8ft.
Alopecias vulpes	,,	6ft. 9in.
Notidanus indicus..	,,	6ft. 4in.

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* W. H. Haswell, M.A., the accomplished Curator of the Brisbane Museum informs me that he has recently secured a specimen of this species 10 feet in length.

† Baron N. de M.-Maclay makes of this a new species under the name of *O. cinerea.*

Scyllium maculatum	,,	2ft.
Cheloscyllium furvum [‡]	,,	3ft.
Crossorhinus barbatus	,,	6ft. 8in.
Heterodontus philippi	,,	4ft.
,, *galeatus*	,,	3ft. 6in.
? *Rhina squatina*	,,	3ft. 9in.
Mustelus antarcticus	,,	3ft. 6in.
Pristiophorus cirratus	,,	3ft. 6in.

Twenty species in all. Baron N. de M. Maclay and the Hon. Wm. Macleay have already given us some valuable and interesting details on our Australian Sharks, which will be found in a previous number of our proceedings.

Plate IV.

Fig. 1.—Shows the general outline of the fish.
,, 2.—The form of the head.
,, 3.—The nostril.
,, 4.—Teeth of the upper jaw.
,, 5.—Teeth of the lower jaw.
,, 6.—Shows the outline of the parabolic form of the head.

ON SOME NEW AMPHIPODS FROM AUSTRALIA AND TASMANIA.

BY WILLIAM A. HASWELL, M.A., B.Sc., CURATOR OF THE QUEENSLAND MUSEUM, BRISBANE.

Plates V.—VII.

Talitrus assimilis, *sp. nov.*, Plate V., fig. 1.

Distinguished from *T. sylvaticus*, which it otherwise very closely resembles, by the form of the posterior gnathopoda—the meros having a truncate process below, the carpus having its lower border convex, and the propodos having a longitudinal, hairy ridge.

[‡] A new species, closely allied to *C. modestum*, Gunth.

Hab. Tasmania (Australian Museum, collected by Mr. Kendall Broadbent).

Talorchestia limicola, *sp. nov.*, Plate V., fig. 2.

Male.—Superior antennæ as long as the cephalon and first segment of the pereion, flagellum as long as the last two segments of the peduncle, of five articuli. Inferior antennæ four times as long as the superior pair, peduncle and flagellum sub-equal, the latter consisting of twelve articuli. Anterior gnathopoda having the carpus produced below into a rounded prominence, the propodos sub-quadrate, broader distally than proximally, palm transverse; dactylos well-developed. Posterior gnathopoda with the propodos large, sub-quadrate, broader distally than proximally; palm transverse, armed externally with two rounded teeth, separated by a deep excavation from the rest of the palmar border; dactylos powerful, pointed, as long as the palm, provided internally with a rounded protuberance.

Female.—Anterior gnathopoda with the carpus and propodos of nearly equal length, the former sub-triangular; the propodos long-ovate, with two hair-armed serrations on its upper and lower borders; dactylos two-thirds of the length of the propodos, acuminate. Posterior gnathopoda small, carpus and propodos sub-equal; the latter with an obscure, downwardly projecting process at its distal extremity; dactylos short, articulating near the middle of the lower border of the propodos, and not nearly attaining the distal extremity of the latter. Length 7/20 in.

Hab. Mangrove-swamps, near Bowen, Queensland, under decaying wood, etc.

This species is distinguished from *T. quadrimana*, Dana, by the form of the palm and dactylos of the posterior gnathopoda in both sexes.

Talorchestia terræ-reginæ, *sp. nov.*, Plate V., fig. 4.

Male.—Superior antennæ rather longer than the cephalon; flagellum as long as the last two segments of the peduncle, of six to eight articuli. Inferior antennæ more than four times as long as the superior pair; flagellum as long as the last segment of the peduncle, of about 20 articuli. Anterior gnathopoda with the carpus longer than the propodos, the latter slightly curved downwards, narrow, of nearly uniform breadth from end to end, slightly dilated at the infero-distal angle; palm transverse; dactylos longer than the palm. Posterior gnathopoda with the propodos large, heart-shaped, the palm oblique, armed with short bristles, and provided near the distal end with a prominent, compressed, curved process which lies in an open hollow of the opposed border of the dactylos when the hand is closed.

Female.—Anterior gnathopoda with the carpus longer than the propodos, both narrow and armed with a few stout setæ. Posterior gnathopoda with the propodos provided with a short rounded projection directed upwards, at the distal end of its dorsal border; extremity of dactylos scarcely reaching the distal extremity of the propodos. Length 2/5 in.

Hab. Port Denison, Queensland, on sandy beach.

Talorchestia ? marmorata, *sp. nov.*, Plate V., fig. 3.

Male.—Superior antennæ longer than the cephalon; flagellum rather longer than the last segment of the peduncle, composed of five articuli. Inferior antennæ rather more than three times as long as the superior pair; peduncle stout; flagellum as long as the peduncle, composed of about 17 articuli. Anterior gnathopoda with the carpus sub-triangular, its infero-distal angle produced into a compressed, rounded process; the propodos sub-equal with the carpus, much broader distally than proximally, the infero-distal angle produced and rounded; the palm transverse, armed with short setæ; the dactylos well-developed, shorter than the palm. Posterior gnathopoda large; carpus minute, propodos heart-shaped, the palm oblique, armed with numerous short setæ, and defined by a minute acute tooth. Pereiopoda very thick, base of last pair not dilated behind. The whole of the integument very hard. Colour marbled red and white. Length 13/20 in.

Hab. Tasmania (Australian Museum), collected by Mr. Kendall Broadbent.

Talorchestia pravidactyla, *sp. nov.*, Plate V., fig. 5.

Male.—Superior antennæ scarcely so long as the cephalon and the first segment of the pereion; flagellum as long as the last two segments of the peduncle, composed of seven articuli. Inferior antennæ more than three-times as long as the superior pair; last segment of the peduncle more than twice as long as the penultimate; flagellum as long as the last segment of the peduncle, of 21 articuli. Anterior gnathopoda with the propodos broader distally than proximally, the infero-distal angle produced into a short narrow process; palm transverse, concave; dactylos acute, rather longer than the palm. Posterior gnathopoda having the propodos large, heart shaped, the palm oblique, defined by a blunt tooth, with a second tooth close to it on the distal side, and a rounded elevation about the middle; dactylos geniculate, its apex lying between the two palmar teeth when the hand is closed. Last pair of pereiopoda with the basos dilated posteriorly.

Female.—Inferior antennæ much smaller than in the male. Anterior gnathopoda with the carpus much longer and broader than the propodos, the latter about twice as long as broad, rather narrower at its distal, than at its proximal end. Posterior gnathopoda with the propodos narrow, thrice as long as broad, the dactylos very short, inserted nearer the distal end than the middle of the ventral border of the propodos. Length 13/20 in.

Hab. Tasmania (Australian Museum).

Talorchestia quadrimana, *var.* ? Plate VI., fig. 1.

Differs from the New South Wales species in the smaller size of the posterior gnathopoda of the male, and in various minor points.

Hab. Port Denison.

Genus ASPIDOPHOREIA, *novum*.

Coxæ of the posterior gnathopoda and of the first and second pairs of pereiopoda greatly expanded, deeper than the respective segments, those of the three last pairs of pereiopoda small, that of the third pair bilobed—the posterior lobe larger than the anterior. Antennæ simple; the superior pair shorter than the inferior. Mandibles without an appendage. Maxillipedes with a pointed dactylos. Gnathopoda sub-chelate—the posterior pair much larger than the anterior. Posterior pleopoda uniramous—the ramus uniarticulate. Telson squamiform, cleft to the base.

This genus differs from *Stenothoë*, Dana, in having the ramus of the last pair of pleopods uniarticulate; in most of its characters it approaches *Allorchestes*—being distinguished from that genus only by the largely developed anterior coxæ, and the character of the telson.

Aspidophoreia diemenensis, *sp. un.*, Plate VI., fig. 2.

Superior antennæ as long as the cephalon and the first segment of the pereion, rather longer than the peduncle of the inferior pair; flagellum longer than the peduncle, of about 20 articuli. Inferior antennæ with the peduncle stout, the fourth joint the largest; flagellum slightly shorter than the peduncle, of about 20 articuli. Anterior gnathopoda with the carpus sub-triangular in outline; the propodos larger than the carpus, irregularly triangular, palm transverse, deeply concave. Posterior gnathopoda large; propodos heart-shaped, palm oblique, armed with short bristles. Basa of three posterior pairs of pereiopoda broad, that of the fifth pair much expanded behind; their anterior borders serrate and armed with setæ, the posterior border smooth. Ramus of last pair of pleopoda short, conical, acute. Telson consisting of two quadrangular scales, separated by a linear fissure. Surface (in the spirit specimen) ornamented with marbled spots of red, brown, and white, and ornamented with numerous, very minute, white dots, arranged in clusters of three or four. Length 4/5 in.

Hab. Tasmania (Australian Museum, collected by Mr. K. Broadbent).

Atylus microdeuteropus, *sp. nov.*, Plate VI., fig. 3

Eyes oval, large, but separated by a broad space above. Superior antennæ rather longer than the cephalon and first three segments of the pereion, the flagellum nearly twice as long as the peduncle, its articuli armed distally with short hairs above and below—every third or fourth having its distal and inferior angle dilated and crowned with auditory cilia. Inferior antennæ about half the length of the animal, the flagellum more than twice as long as the peduncle. Anterior gnathopoda with the propodos ovate, the palm oblique, with three short spines near its proximal end; a strong appressed spine on the propodos over the insertion of the dactylos; dactylos toothed internally. Posterior gnathopoda rather smaller than the anterior pair, propodos ovate, armed with three stout spines near the distal extremity of the palm; palm oblique; dactylos toothed internally. Rami of the last pair of pleopoda armed laterally with a few short setæ in the axil of each of which is situated a delicate hair. Length nearly 1/4 inch.

Hab. Clark Island, Port Jackson; Botany Bay.

Atylus megalophthalmus, *sp. nov.*, Plate VI., fig. 4.

Eyes very large. Superior antennæ as long as the cephalon and pereion; flagellum twice as long as the peduncle, every second articulus very slightly dilated at its inferior and distal angle. Inferior antennæ longer than the superior pair, the flagellum about three times as long as the peduncle. Gnathopoda subequal—the posterior pair slightly smaller than the anterior; propodos ovate, armed with a few plumose setæ, palm oblique, undefined. Last pair of pleopods with the rami armed along their edges with numerous serrations, each with a short seta in the axil of which is inserted a delicate hair. Length about 1/4 in.

Hab. Clark Island, Port Jackson.

This and the preceding are very variable species, the size of the eyes and their degree of approximation above, the length of the antennæ and the form of the gnathopoda being all subject to considerable variations.

Pherusa australis, *sp. nov.*, Plate VII., fig. 1.

Six anterior segments narrow; the four following broad. Cephalon with a small rostrum. Superior antennæ nearly as long as the cephalon and pereion; first two joints of the peduncle stout; third small, scarcely distinguishable from the articuli of the flagellum; flagellum slender, about twice as long as the peduncle. Inferior antennæ slightly longer than the superior pair; flagellum scarcely twice as long as the peduncle. Anterior gnathopoda with the propodos ovate, the palm oblique, undefined, armed with short setæ. Posterior gnathopoda larger than the anterior pair, the propodos ovate, dilated proximally, armed with a few short setæ and hairs towards the palmar border; palm oblique, undefined. Fifth pair of pereiopoda much longer than the preceding pairs; the dactylos elongate, slender, straight. Last pair of pleopoda with the rami lanceolate, acute, each armed on the inner border with three setæ. Length 1/5 in.

Hab. Botany Bay.

Moera crassipes, *sp. nov.*, Plate VII., fig. 2.

Antennæ sub-equal, nearly as long as the cephalon and pereion, fringed below with long slender hairs. First pair of gnathopoda with the carpus and propodos sub-equal, their upper border nearly straight, the lower strongly convex. Posterior pair of gnathopoda unequal, the right much larger than the left; the palm deeply concave, with a minute tooth about its middle, and defined with a second, prominent, acute tooth. Fourth and fifth pairs of pereiopoda very much longer and broader than the rest, the fourth pair the broadest. Rami of last pair of pleopoda broad-lanceolate, rather short. Halves of telson conical, each tipped with a stout spine.

Hab. Port Jackson.

Cyrtophium (?) hystrix, *sp. nov.*, Plate VII., fig. 3.

Cephalon, pereion and first two segments of pleon armed with prominent spines on the dorsal and lateral surfaces; lateral borders of the second to the sixth segments of the pereion produced outwards and upwards, acuminate. Coxæ of the pereiopoda each armed with a small point in its lower border. Antennæ stout, superior pair as long as the cephalon and pereion, basal joint of the peduncle short, with an acute spine above; third joint the longest; flagellum shorter than the last segment of the peduncle. Inferior antennæ longer than the superior pair, very stout, fifth joint of the peduncle longer than the fourth, flagellum much shorter than the last segment of the peduncle. Anterior gnathopoda with the carpus and propodos sub-equal, both armed ventrally with a row of setæ, palm straight, oblique; dactylos longer than palm. Posterior gnathopoda with the carpus very small, the propodos large, ovate, narrower at its distal than at its proximale end, palm nearly longitudinal, undefined. Pereiopoda subequal, the fourth pair longer than the preceding, the joints broad, the dactylos very stout. Penultimate pair of pleopoda with two unequal rami, the outer shorter and narrower than the inner, tipped with two acute bristles, the inner broad, armed terminally and internally with a few strong bristles. Last pair of pleopoda uniramous, minute, almost concealed under the broad rounded telson.

Hab. Port Jackson.

The absence of the fourth segment of the pleon is probably sufficiently important to separate this species from the genus *Cyrtophium* of Dana (to which, however, it otherwise bears a close resemblance; but, having but a single, somewhat mutilated

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specimen, I have been unwilling for the present to give it a distinct generic name.

EXPLANATION OF PLATES.

In all the figures *a.*=superior antennæ; *b.*=inferior antennæ; *f.*=anterior gnathopoda; *g.*=posterior gnathopoda; *p.*=sixth pleopoda; *x.*=telson.

Plate V.

Fig. 1.—*Talitrus assimilis*, gnathopoda.
" 2.—*Talorchestia limicola*, five times natural size.
" 3.—*Talorchestia marmorata*, three times the natural size.
" 4.—*Talorchestia terræ-reginæ*, four times the natural size.
" 5.—*Talorchestia pravidactyla*, four times the natural size.

Plate VI.

Fig. 1.—*Talorchestia quadrimana*, var. ? details magnified 25 diameters.
" 2.—*Aspidophoreia diemenensis*, three times the natural size.
" 3.—*Atylus microdeuteropus*, eight times the natural size.
" 4.—*Atylus megalophthalmus*, eight times the natural size; *f'* and *g'* gnathopoda of variety.

Plate VII.

Fig. 1.—*Pherusa australis*.
" 2.—*Mœra crassipes*.
" 3.—*Cyrtophium hystrix*, magnified about 25 diameters.

NOTES AND EXHIBITS.

Mr. Ramsay for Dr. Cox—Several fine live specimens of an *Astacopsis* from Mount Wilson.

Mr. Masters—a rare and beautiful pigeon *Phænorhina Goliath*.

From Mr. Armstrong of Lord Howe's Island, specimens of Coffee and Arrowroot produced on that Island.

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WEDNESDAY, MARCH 31st, 1880.

The President, the Rev. J. E. Tenison-Woods, F.G.S., F.L.S., &c., in the Chair.

G. D. Hirst, Esq., was elected a member of the Society.

DONATIONS.

From Baron F. von. Mueller, K.C.M.G., Eucalyptographia, IV. Decade.

From Harvard College, Three Nos. of the Bulletin of Museum of Comparative Zoology, Vol. V., No. 15, and Vol. VI., Nos. 1 and 2.

From Capt. F. W. Hutton, Otago, Zoological Exercises fòr Students in New Zealand.

From J. Brazier, Esq., Brief account of the Natives of Western Australia.

Societe Entomologique de Belgique, Compte Rendu. Serie II. Nos. 69—72.

PAPERS READ.

ON SOME OF THE LITTORAL MARINE FAUNA OF NORTH-EAST AUSSTRALIA.

BY THE REV. J. E. TENISON-WOODS, F.G.S., F.L.S., &c., PRESIDENT LINN. SOC., N.S.W.

During the years 1875-76, I was partly engaged in investigating the littoral marine fauna of Tasmania, and my observations have been published in the Transactions of the Royal Society of Tasmania for 1876, and those of the Royal Society of New South Wales for last year. I was very glad of an opportunity recently afforded me for examining the Coast Shells of North-East Australia not only because this part of the continent has been so little visited, but also for the sake of comparing results obtained from these two extremes. It may be observed that though the tropical coasts of Australia, have been visited and examined by such accomplished naturalists as Huxley, Jukes, Darwin, McGillivray, Mosely, Dana, and others, yet the Littoral Shells have never been specially studied. There are so many other objects of great importance and interest in these localities that the littoral fauna has been passed over, and so I find the field quite untrodden.

The places to which my observations more especially refer are from Trinity Bay to the Endeavour River, a distance, in a straight line, of about 100 miles, and lying between S. Lat. 17° and 15° 30'. There are only a few places on this coast line where an examination is possible, as not only are there few settlements, but the coast itself is as a rule inaccessible, and the natives implacably hostile. There are three different kinds of littoral fauna to be seen. One is on the coral reefs. There is not much of this close in shore, but occasionally fringing reefs are found. I shall not deal with these in detail, because I purpose making them the subject of a series of special papers. There are two others which bear marked and distinct characters, that is the mangrove fauna and that of the exposed rocky coast. Sandy beaches are rare in this part of the coast of Australia. Generally speaking the precipitous hills of the cordillera seem to plunge direct into the sea and are covered with the dense jungle of tropical vegetation to the very water's edge. Still there are some fine sandy beaches, such as at the mouth of the Endeavour, the Bloomfield, the Daintree, and the Mossman Rivers, besides a magnificent stretch of sandy beach in the south side of Island Point, Trinity Bay. For the whole of these distances there are no signs of upheaval or subsidence, but a gradual reclamation of the land by the drifting up of marine sand. The rocks wherever exposed are volcanic or granite. They are ancient in appearance. There are no recent dolerites, such as we so frequently observe on the south coast.

The first thing that strikes the observer is the bare character of the rocks in many places. One frequently meets with spots where there is not a single mollusc to be seen adhering to the cliffs and boulders along the shore. A few serpulæ and a number of a small species of *Balanus* may be noticed, but no molluscs and no seaweeds. The broad green fronds of the *Ulva latissima* so frequently covering the rocks in temperate latitudes, are absent as well as the confervoid growth of the sides of the rocky pools. The comparative absence of Algæ and Confervæ prevails everywhere as much around the coral reefs as on the rocky shores, but in the latter places, the mollusca vary in amount. Along the black rocky boulders of Island Point, Port Douglas, molluscan life is very abundant. A very large portion of the rocks is literally covered with a species of oyster. In habit and in mode of aggregation it is closely similar to the Port Jackson oyster, *Ostrea mordax*, Gould, but it is a different and probably described. species. The edges of the valve are much more regularly undulate so as to have a frilled appearance, and the lower or adherent valve is subquadrate, and the edge comes up squarely all round just like a little box into which the upper, free valve fits like a lid. I believe it to be *Ostrea cucullata*, of Born (*Mus.* p. 114, plate 6, figs. 11 and 12) and Chemnitz *Ostrea cornucopiæ* (Conch. Cab. 8, p. 41, plate 74, f. 679). Born describes it as "Shell oblong, parasitical, with longitudinal plaits and strong imbricated, transverse wrinkles; upper valve flat, and its margin by the hinge somewhat toothed." In the figure of Born the lower valve is concave and ends in a long beak. This is a common form but not the usual one. It is quoted by various authors as from the Atlantic (West coast of Africa), Ascension Island, China, Arabia, and Sumatra. Humphreys (Conchology, or Natural History of Shells) says it is found in the South seas. I observed the same species in many places on blocks of dead coral on the reefs, in fact it seems to be abundant everywhere upon the coast within the tropics. It is of delicate flavour, and highly prized by the inhabitants, both black and white.

Next to this in abundance upon the rocks is *Plaraxis sulcata*, called perrywinkle by the settlers, and is boiled and eaten in considerable quantity. There are places on the rocks just above the tidal marks where a basket can be filled in a few minutes by sweeping one's hand along the surface. They are packed quite close together. I shall add a few remarks upon the genus and species further on, but I may observe now that the habits of this mollusc are entirely those of the *Littorina*, which it almost completely replaces in the tropics. It extends abundantly, to my knowledge as far south as Moreton Bay. It reaches a larger size than *Littorina cærulescens*, of our coasts. It was my impression at first that the *Littorinas* of our south coasts and of Tasmania were not found within the tropics. But with a very careful search I was able to discover here and there solitary examples of *Littorina cærulescens*. When dwarfed in size, it was somewhat rugged with lines of growth showing how slow was its progress, and sometimes curiously mottled with brown. On the reefs it was occasionally met with, but a much finer and more solid shell with very little of the elegant bluish-white tint so common on all the south coasts. This shell reaching its maximum of development in South Tasmania, and as I believe with Deshayes and others, identical with *L. cærulescens* of the Mediterranean, and *L. mauritiana* of the Cape, as far as Natal. I have paid some attention to this little species. and have watched the effect of climate upon it with interest. Just as we notice the old residents of North Australia by their peculiar aspect, so we may notice the old established *Littorina*. It is evident that certain rocks do not agree with it, and few are found to live within their limits, and those only in a stunted, distorted condition. I was inclined to think that *Littorina pyramidata*, Quoy, had entirely died out. This is the pagoda-like perrywinkle, with the double line of tubercles on the body whorl, and an elegant single row upon the spine; I soon found that I was mistaken. It is somewhat common at Port Douglas, though I never saw it anywhere else, and it never attains one-fourth the size of the Port Jackson specimens. The distribution of this species is remarkable. In South

Tasmania it is unknown, on the east coast it is very rare, and then they are only poor, small, and distorted specimens. About the region of Port Jackson it attains its maximum of development and is sometimes an inch and more in length. But it is not common inside the harbour. It is only seen at intervals along the east coast and I did not notice it about Cape Moreton or in Moreton Bay. I did not see it at any place on the coast, except Port Douglas, and there the size never exceeded a quarter of an inch. The climate appears to stunt its growth completely, though preserving its colour and shape. The result is interesting as a climatial influence if we compare its efforts with what we should witness if particular regions were to affect horses or cattle in a similar way. In contrast with this we have a remarkable illustration of the effects of climate in an exactly different manner. The rocks are frequently covered with a large species of *Acmæa*, which may have been described many times by different observers as it varies so much. It is common on all parts of the east coast which I have visited and equally common on Tasmania. It passes into Bass' Straits, but is not common on the south coast. In Tasmania it may be seen at its lowest state. It is small, irregular in growth, very much stunted, and sordid in appearance. Though not at all uncommon it is not easy to recognize on the rocks. The best point of resemblance throughout is the peculiar mottled spathula which is very characteristic and never can be mistaken. It is a true *Acmæa*, with the gill plume at the back of the neck, and by this feature also and the peculiar ribbed structure it can always be known. As it is traced northward from the extreme south of Tasmania, where I first saw it and described it as a new species under the name of *Acmæa marmorata*. (See Proc. Roy. Soc. Tas. 1875, p. 153.) it gradually increases in size and the colors of the shell become brighter and more clear. It can be thus followed over the Straits and on to the Australian coast. It receives its maximum of development in North-east Australia; thus inhabiting a line of coast from South Tasmania to Cape

York, a distance of very near 3,000 miles. It is evidently a tropical species, and grows largest and is in the finest condition within the tropics. I do not think that an impartial person could avoid recognizing it as one species, even though a comparison were instituted between specimens from the two extremes, that is from South Cape in Tasmania and Cape York in Australia. It is not very common at Port Douglas, of large size—(1¼ inch in length)—and of bright colours. The brown spots in the spathula are paler and more distant, and all the colouring is more distinct. The radula or lingual ribbon is exactly similar in the specimens wherever they are obtained. We have therefore in this an example of a species which thrives through a very wide area, but is evidently better adapted for a warm climate. The case is thus the reverse of the *Littorina pyramidata.*

But we have another example on this coast which is different again. *Acmæa septiformis,* Quoy and Gaimard, is as all naturalists are aware very common on all the coasts of Southern and South-eastern Australia and Tasmania. It is not so well-known that it is found at intervals all along the coast into the tropics. At Port Douglas it is very common in places, but generally far up on the rocks and not very easy to discover. It is neither smaller nor larger than the specimens in my possession from the coldest part of Tasmania, and it does not seem to have varied in its colouring. That is to say it is as variable on the North Coast as on the South. but much within the same limits. It has always been my impression that no distinction could be made between this species and *A. testudinaria,* of Muller, which is so common in Great Britain, and since our species can be traced in the hottest as well as the coldest seas in Australia, without alteration, and on thousands of miles of coast we may well believe that it is of world-wide distribution.

I call attention here to these facts, because they show how no general rule can be adopted for the way in which mollusca are affected by climate. We have thus—1. *Acmæa marmorata,* which is stunted in a cold climate to a fourth its size, and reaches its maximum of development in the tropics. 2. *Littorina pyramidata* which reaches its maximum of development in the temperate seas of Australia, and is dwarfed and deformed in the tropics. 3. *Acmæa septiformis*, which ranges through every climate from the extreme of cold to the extreme of heat, and is not affected by climate at all.

The conclusions to be drawn from these facts are far more important than would appear at first sight. We are accustomed to say that certain shells are tropical in character, and indicate a tropical fauna, and this would appear justifiable as far as the present fauna of Australia is concerned, but when we apply it to geology the conclusions are not by any means so certain. There may be species with a very wide range, and the development of one species which we are inclined to refer to the influence of warmer seas, may be from quite a contrary course. We have an instance of this in *Pectunculus laticostatus*, Lam., which is found extensively developed in our Tertiary rocks, but principally in the Miocene of Victoria. It is still found on the coasts of Australia but rarely, and of small size. But its maximum development is now in New Zealand, where it reaches as large a size as any of the fossil forms, but generally in the colder parts of the Middle Island coast.

We have only one *Patella* on the coast of Trinity Bay, that is to say only one true *Patella*, with the gills as a fringe round the foot. This is *P. tigrina ?* Gm., with its very conspicuous, silvery-white nacre. It is a shell of moderate size and not very common, generally preferring the very outermost rocks where it is washed by the spray of even low tides. The older shells are much corroded, one distinguishing feature about the species is the well-defined spathula which is of light brown color, and has even the impression of the tentacles on each side of the head. It would seem as if the spathula is caused by some corrosive action of the mantle on the shell, because on old shells a slight pressure from the inside will make it break clean away. The radula of this species is short in comparison with *P. tramoserica*, being seldom over three inches in length.

A mollusc, which is here in far greater abundance than any of the *Patellidæ* whose form it resembles, is a species of *Siphonaria*. It would be very difficult to assign a name to it without considerable study into the claims of species, but I certainly think it is only one of the many varieties which from time to time have been distinguished by the names of *S. diemenensis*, *Baconi*, *funiculata*, and many other synonyms. It is a ribbed shell, with white ribs and brown insterstices, but I cannot see any or even much difference between the varieties that have been named. It is just as common within the tropics as all along the east and south coasts of Australia and Tasmania. The animal is the same in every respect and the radula also. I think the typical specimens have a little advantage in point of size, but that is the only difference I can detect. It is more numerous than any of the *Patellidæ*, and this holds good of every part of the coast which I visited, within the Barrier Reef, but I have not often found it on coral reefs or anywhere except rocks, fringing the shore above the tidal marks. I consider it as especially characterizing the littoral fauna of Australia. I am not aware whether or not it has been remarked that the genus *Siphonania* is more peculiar to the Southern hemisphere than the Northern.

In estimating the peculiarities of the littoral fauna at Island Point, Port Douglas, it must be borne in mind that the rock formation may have something to do with it. That formation is a dark phonolite stone which does not easily decompose, neither does it give rise apparently to much ferruginous earth or clay. Yet I attribute something to its influence. It abounds with *Planaxis sulcata*, as I have already remarked, the *Patellidæ* are also abundant, so are oysters and several species of *Nerita* to be mentioned presently. On the coral reefs close at hand there are equal numbers of oysters. *Patellidæ* are not common, though not entirely absent. Here and there you meet with *Planaxis*, but no *Nerita*, and *Littorina cærulescens* is quite a different shell: large, solid, ivory-white, with the purple-brown markings of the interior and the rose spots near the mouth very brilliant and distinct. The rock of the coral reefs is a light-brown mass of coral and coral sand, and for the most part is covered at high water. This may be one of the reasons why there are so few littoral shells. But even on those reefs where a portion of the rock is always uncovered, *Siphonaria* is nearly the only species that is common, besides oysters.

There are four or five species of *Nerita* on the Port Douglas rocks. They are generally congregated together above high water mark in groups of 20 or 30. *Nerita costata* is the most common. This species is distinguished by its uniform, dull olive-green colour, and its few broad, nearly flat, spiral ribs. It does not seem to vary. On the other hand an equally common one is *Nerita polita* and of this there are endless patterns in its bands, spots, and zigzag markings of black, white, and grey. *Nerita grossa* is another common form. It is a large, somewhat thin, tumid shell, deeply toothed at the mouth. It may be mistaken for *N. costata*, with finer ribs and a more elevate spine, but the operculum is quite different. But there is a doubt about the identification of *N. costata*. It was originally described by Gmelin thus:—" Shell yellowish within, subglobular, surrounded with thicker striæ, the interstices snowy, both lips toothed, the outer one crenate throughout, inner one sub-convex, wrinkled and tuberculate. Inhabits Nicobar Islands. Shell russet-brown or piceous, crown very obtuse, generally worn and yellowish or white." Born and Chemnitz are quoted for the figures. The latter corresponds with our shell, and so does the description, except the yellow interior, which is a variable character. I cannot well understand how Nicobar Islands can be the habitat and for it not to have been seen at intermediate stations. All the other *Neritas* of Port Douglas are Linnean shells and were described by Rumphius from specimens obtained by him in the Moluccas.

Nerita albicilla, L., is another common form on the Port Douglas rocks. It is distinguished by a less oblique form than *N. costata* the ribs are not so coarse, the columella concave, teeth on both lips, fine and numerous, and the whole shell is conspicuously marked black and white in a varied style of ornamentation, of which a broad, white, spiral band is the most common. It was described from Rúmphius by Linnæus, who refers to the former's figure. According to Hanley, type specimens are preserved in the cabinet of Linnæus. The habitat given is the Cape of Good Hope and Indian Ocean, but the first locality may be erroneous.

All the species have the peculiarity of keeping on the rocks above tidal marks, like the *Littorinæ*. The various species seem to group together and keep very distinct; the only wanderers being *N. albicilla*, which are sometimes found at the bottom of pools.

There is one point of distinction between all the *Neritas*, and that is in the operculum. Shells that resemble each other in many ways are found to have quite different opercula. I shall speak presently of a characteristic instance of this when dealing with the mangrove fauna. The opercula of *N. polita*, *N. costata*, and *N. albicilla*, are very characteristic. The latter though a more finely marked shell than *N. costata*, has an operculum covered with much coarser granulations. *N. polita* has a smooth and beautifully polished operculum, with a defined margin of rugæ. This renders the shell easy of identification. It has been long known to naturalists. This we gather from the host of figures quoted by Linnæus. There is an exceptional uniformity in these figures; the type specimens still exist in the Linnean cabinets. *N. mollucensis* is also found at Port Douglas, and some others to be mentioned presently.

Two species of *Chiton* are sufficiently common on the rocks. One appears to be the *Chiton spinosus* of Reeve. The other may be a new species, and requires examination. The first is very common and equally so on the coral reefs. Both these species keep above the tidal marks, but just within reach of the surf and spray.

Besides the *Ostrea*, which may be regarded as representing *O. mordax*, there is a larger species, a *Chama* and a *Spondylus*, all common. *Purpura, (Polytropa) tuberculosa* is common also, but not so large as the specimens found at Port Jackson. The rocks are also conspicuonsly covered with two species of *Balanus* which are unknown to me as yet. One is a pyramidal form not observed further south.

Thus it will be seen that the tropical littoral fauna of the rocks does not differ much from the fauna we meet with outside the tropics. Some of the species are the same, but there is a change in others; thus the *Trochocochleæ* of the south have disappeared. Instead of seeing on every rock and stone crowds of *Trochocoolea australis*, *T. odontis*, and *T. constricta*, the place is occupied by very many species of *Nerita*, species which have a wide range throughout the tropics. The *Patellidæ* are partly different, and so are the *Littorinidæ*, *Planaxis sulcatus*, being the common form. The *Trochidæ* are entirely different. *Monodonta labio*, and *Trochus niloticus*, *T. cærulescens*, and some others are frequently met with. In many of the pools two or three species of cones will be found such as *C. hebraica*, *C. textilosa*, *C. capitaneus* and some others. *Cyprea arabica* is found almost under every stone. I might extend the list, but this will suffice to give an idea of what is the general character.

On the rocks at Port Douglas there are few or no corals. Very rarely one may meet a small patch of *Porites* or *Favia Bowerbankii*, but I never saw any other. These I may say are two of the hardiest species of coral as well as the commonest in this locality. *Favia Bowerbankii* does not seem to mind mud or sediment, which is fatal to most corals. Thus I have seen it encrusting a large proportion of the stones at the mouth of the Mangrove Creek.

All these stones are covered with mud and slime, and the place is washed over twice in the 24 hours by muddy, brackish water.

Far out upon the rocks there are a good number of *Alcyonaria* or soft corals as they are called belonging to the genera *Alcyonum*, *Ammothea*, *Xenia*, *Anthelia*, and *Telesto*. I believe they are all of undescribed species. In every pool there are *Anemones* belonging to the families *Actininæ*, *Thalassianthus*. The same pools are also distinguished by two or three long snake-like *Holothurids*, probably belonging to the genus *Synapta*, they are not of any value to the trepang fishermen and so are not molested. They may be seen stretching out for two feet and more gathering their food with the beautiful arborescent tentacles which form a ring around their heads; they are of a deep brown colour covered with wort-like papillæ. There are no anchor-like spines in the skin.

I have made but few special observations on the crustaceans, but I cannot help noticing a species of crab which abounds on the rocks. This is the *Grapsus pictus* of Latreille. It may be seen running away over the boulders and into the surf on the approach of any moving object. It is strange how tenaciously it can fasten to the bare surface of the rock so that the heaviest surf has no effect in moving it. They seem to have very low powers of hearing as they cannot be startled by the loudest noise, They make up for this by their powers of sight, as the smallest movement makes them start off for the water. They appear to feed upon an algal which grows upon the rocks, and certainly it is most ludicrous to watch them raising their claws alternately to their mouths while feeding, and at the same time standing, as it were, upon tiptoe, so that the sharp points of the rest of the legs may hold well into the inequalities of the rock surface. The species has an immense range, being equally common in the Cape Verde Islands, St. Helena, South Africa, the Mauritius, California, Peru, Georgia, West Indies &c, Miers quotes it as belonging to the New Zealand fauna, but I think the species is different. It is not at all uncommon on the temperate regions of the Australian coast. When alive it has a dark, but clear green carapace, beautifully mottled and lined into a pretty pattern of lighter and darker spots and cloudings. When dead in cabinets, the colours fade into a redish brown. I could not discover whether the natives used it for food, but it is eagerly devoured by a large Octopus *(O. indicus ?)* which is common here.

The settlers gather and use another species, this is *Thalamita stimpsoni*, with very beautiful blue tips to the claws. It is found under stones, and is very warlike, biting furiously, and holding tenaciously. I noticed two other species, *T. sima*, M.-Ed., and *T. danæ*, Stimpson. Both these are said to occur in New Zealand, but I am doubtful about *T. sima*, which is, as far as I know only tropical in Australia. On the sands of Port Douglas and as far as Cleveland Bay, I noticed *Ocypode brevicornis*, I never saw it except on a sandy beach, and when pursued it took readily to the water.

On all the sandy places on the north side of Island Point a species of starfish, *Pentagonaster (Stellaster) Incei*, Gray, is very common. I did not notice it on any other part of the coast, but in one spot it is drifted up in dozens at every tide. Here also *Pentaceros Franklinii*, was found by me as well as *Anthenea tuberculosa* and an *Astropecten*, which I take to be *A. polyacantha*. Had I been able to dredge at this spot I have no doubt I should have found many other species from the fragments I saw upon the beach.

I turn now to the fauna of the mangroves, which is peculiar and entirely different from that of the coast. The creek at the back of Island Point, is a salt water inlet running between the township and the mountain range, which rises about a mile further inland. It is not navigable for more than four miles. Only in the rainy season does it ever bring down much fresh water, but it is always a muddy tidal stream with a coral reef at the mouth, and a dense growth of mangroves on the banks. The common species is the *Brugiera Rheedii*, with occasionally a fringe of

Ægiceras majus; this is different from the mangrove vegetation of the southern parts of Australia, where the growth is principally *Avicennia tomentosa*. Those who have never seen a true mangrove scrub can have no idea of how thickly it covers the banks of a stream with its narrow roots. The seed, as is well-known, germinates upon the branches ere the flower falls. The fruit enlarges until it becomes a long, pendulous, slender, green branch, often 10 to 20 feet long swaying in the wind until it roots in the mud beneath. The mud banks as they are uncovered by the tide present a most peculiar appearance. It is a close net work of light-brown stems, usually not thicker than an inch in diameter, and rooting in the mud in all directions. There are no thick stems amongst them. Only here and there a close thicket of young, straight shoots of *Ægiceras majus*, spring up amid the mud.

The first thing that one notices in the mangrove at Port Douglas is the abundance of a crustacean, *Gelasimus coarctatus*, M.-Edw. It makes its nest in the mud by the side of a mangrove root. This retreat is a mere round hole which the crab digs out by the aid of his large, disproportionate claw. I have watched these little animals with great interest. They come out when the tide is low, moving very stealthily and with their large claw folded up under them. They feed on some animaculæ in the mud, but I could not ascertain what was the nature of this food. The smallest movement causes them to start back to their holes. If they are not molested they continue feeding until the tide begins to rise; then they go back to their retreats, and shovelling up a great mass of mud with the large claw, they draw it after them as they go in, completely closing up the hole so that a careful examination will not enable one to discover it. They are beautiful objects when living. The claw is a bright orange-color, paler towards the tip, but this tint fades rapidly after death.

Next after these crabs, I know of no object more interesting than the "hopping fishes" as they are called. This is the

Periophthalmus australis of Castelnau. The mud is literally alive with them when the tide is out. They are about eight or ten inches long with large scales, and fins like seal's flippers, with which they move very rapidly, a kind of leap. They are difficult to catch, but a native boy I had with me was able to knock them over easily with small stones, which he threw with unerring aim. They say that this fish climbs on the roots of the mangrove, but I never saw it do so. It keeps on the wet mud, and is always more or less moistened with the slime. It never comes out on the sand. I think it feeds on the small crustaceans or worms, but I could not ascertain this to my satisfaction. They say that it utters a loud clicking noise, not unlike the crack of a whip. I heard the noise repeatedly, in fact it is quite remarkable and continuous but I could not satisfy myself that it came from the fish. My own opinion was that it was caused by one of the crustaceans. There is however a fish in the Port Douglas Creek, which gives utterance to croaking sounds when captured, of which I was repeatedly a witness.

On the roots of the mangroves, and sometimes high up on the stems of the trees, four or five species of mollusca are found. Of these two species of *Nerita* are the most common. *Nerita lineata* is very abundant, and of large size; from an inch to an inch and a-half in diameter is the usual size. The natives have used them extensively as an article of food, for large mounds of them are seen in the sandy banks of the creeks near Bowen, with quite a heap of the shelly opercula. They do not climb high up on the trees. This species has a wide range through the Indian Archipelago, and in Australia as far south as Moreton Bay. It is surprising that it was not known to Linnæus: as all the other Indian *Neritas* seem to have passed through his hands. Side by side with other species, but by no means so common, is the *N. atropurpurea* of Recluz. It is apt to be mistaken for *N. lineata*, though it is smaller. I was collecting the radulas of the latter and did not observe that I had got *N. atropurpurea*, until I found

I had some very distinct opercula amongst those of *N. lineata.* That of *N. lineata* is large and rough, completely covered with granulations of light color. That of *N. atropurpurea* is smooth, highly polished, and of dark blue-black color.

Occasionally there is found upon the mangroves, but rather high up on the branches small groups of *Cassidula angulifera,* I never noticed any other species though *A. auris-judæ,* is common on the mangrove further south.

Cerithium (Pyrazus) sulcatum, Born, is found occasionally. *Cerithidea decollata* ? Linn., is very common in places far out of reach of the tide marks and far above high water, I have found the latter on small stems of *Melaleuca leucodendron* which is rather abundant outside the margin of the mangroves on the flooded flats. *Littorina scabra,* is also abundant and of large size. The range of this species is very great. It is common on the *Avicennia* mangrove of Port Jackson, though of small size and variable color, and it extends along all the coast as far as it is known, in N.E., N. and N.W. Australia. But it is unknown off mangrove swamps, in fact it only flourishes upon them. The shell of this species is thin and translucent. I presume that the mollusc is a vegetable feeder and may perhaps live upon land plants as it is always found upon them. It always frequents salt or brackish water, but the latter not commonly, and in water so very nearly like the sea that it can scarcely be called brackish, except for a very short time during each tide. Still there are times when the animal must be exposed to the influence of quite fresh water, perhaps for some days during periods of flood. This would be fatal to many marine mollusca, but is borne evidently without harm by *Littorina scabra.* Fresh water is instantly fatal to *Echini* and starfishes. I think I may say that the shell of *Littorina scabra* is the thinnest of any marine shell known to me, and that in this feature it approaches the fresh water shells. That the habit of living on the roots of trees is not sufficient to account for this, is seen from the fact that *Nerita lineata, Cerithium (Pyrazus) sulcatum* and *Cassidula angulifera*, are very solid shells; in fact none of those living on the mangrove are thin except *Cerithidea decollata*.

Imbedded in the mud and quite within reach of salt water, but generally not very close to the sea are large numbers of *Cyrena Jukesi*, Deshayes, (Proc. Zool. Soc. 1854). This is a very solid, large, ovately trigonal shell, irregularly and lightly striate with and when fresh covered with conspicuous, shining, olive periostraca which easily flakes off. Some of the lines of growth are often eroded, and the umbones always are. This erosion it appears to me is the work of some parasite, and not as many think, from the influence of fresh water. The hinge teeth are three in number, with two of them distinctly bifid at the apex. The lateral teeth are distant, one (the anterior) being a blunt tubercle. I enter into this detail because this mollusc is the common form in all the brackish water streams or estuaries, I visited in North-East Australia. I found it in the Endeavour River, in the Daintree, the Herbert, Port Douglas Creek, Ross Creek, the Burdekin, and in the mangroves and swamps around Port Denison. The blacks prize it as an article of food, and large numbers of the shells are always in refuse heaps by the side of the mangroves.

It will be seen from these facts what a great difference there is between the fauna of the mangroves and that of the rocky coast exposed to the sea. Though only a short distance from one another and the water quite salt, there is not one species of shell fish common to both, and the crustaceans seem all to be different as well. The mud has something to do with it, though other circumstances come into play which are well worth an attentive study.

If I refer now to the fauna of the coral reefs near Port Douglas it must not be thought that my remarks are anything more than as to what came under my observation during a few brief visits. The subject is too immense to be dealt with in an exhaustive manner except by a voluminous treatise. There are many reefs in the neighbourhood of Port Douglas, and there is the Great Barrier Reef at about 16 miles distance from the shore. All these literally teem with life, so that a life time would not be enough to enable one to know and see all. I shall confine my remarks first of all to those matters to which I have been calling attention in the first part of this paper.

Littoral shells are not common on the reefs—that is to say, such shells as *Patella*, *Littorina*, *Nerita*, *Planaxis*, &c. The reason of this is probable that these molluscs live for the most part out of the water, and there are only very few parts of the reefs that are not covered for more than 12 of the 24 hours; those portions that are uncovered are not, as a rule, favorable stations for the species I mention. There are not many solidified rocks, but only loose banks of a coarse sand, composed of coral and shell debris. This sand becomes cemented in the course of time into a hard dark-brown, calcareous rock. If there is much coral in it: the structure is very coarse and hard. Large masses of coral, with equally ponderous clams, volutes, *Cassis*, *Trochus*, &c., making up a peculiar and highly ornamental stone, the finer portions become stratified into thin flags with a gentle dip towards the sea. On such rocks I noticed *Siphonaria denticulata*, or a variety of it. Probably some other specific name has been given to it, but where the differences are so very slight, and the features upon which specific distinctions are made to rest are so liable to vary for almost every individual, it would be hazardous to attempt to determine which variety it is. The whole genus needs a thorough revision, and when it receives that, the Australian species will no doubt be found confined to four or five.

Two of the most common univalve shells upon the reefs are *Pterocera lambis*, Linn. and *Strombas luhuanus*, Linn. They must have a very wide range, as they are described as occurring at the Red Sea, and through the whole of the Indian Ocean. Both species are amongst the oldest known to men of science. They were first figured by Lister, nearly 200 years ago, and types are still preserved in the Linnean cabinet.

On the edges of the reefs *Trochus niloticus* is very common and of large size. This is a shell of wide range and ancient history like the last. It is found with *T. ceruleus*, Gmelin, which is not so common. All the shell sand is more or less full of *Chrysostoma nicobarica*, Gmelin. This also has a wide range. In fact except in the relative abundance of species, we may say that for one third of the shells of the Indian Ocean, there is no difference in what we find on the north-east Australian coral reefs. *Cyprea tigris*, L., is not very common, but *C. arabica*, L., *C. lynx*, L., and *C. annulus*, L., are all very abundant. The cones are *C. litteratus* L., (very common) *C. marmoreus*, L., *C. generalis*, L., *C. hebræus*, L., *C. textile*, L., and *C. capitaneus*, L. I made no special search or no doubt I could have extended this list, but I merely wish to record the species which are the most common.

The bivalves are by far the most prominent part of the molluscan fauna of the coral reefs. *Hippopus maculatus*, Chem., is the most common, so common indeed that the reef is thickly strewn with them on every side. It varies in size and in color. I have seen a specimen which was at least ten inches across the valves. The color of the animal varies also. As a general rule it is a dull brown, but very often individuals are found with a fringe of the most brilliant blue or green. The same variation in color is found in *Tridacna squamosa*, Gm., which is equally common. *Hippopus maculatus*, lies loose upon the reef, but *T. squamosa* is attached to the coral rock and requires a considerable amount of care to detach it without breaking the shell. It is not at all unusual to find specimens completely imbedded in the rock in a cavity which allows room for the opening of the shell, but which in other respects fits it exactly. In fact one cannot escape the conclusion that the mollusc must have hollowed out the cavity for itself. It is not uncommon to see a loose block of dead coral with three or four of these large molluscs imbedded in it, fitting exactly into the cavities and lying open with their beautiful blue and green tentacles exposed. On approaching them they close their valves suddenly, sending up a jet of water into the air. I have often had my foot caught between the valves in passing. They can hold with great strength, but a knife inserted into the muscle soon detaches them. It seems to me, strange how they can exist on a loose block of stone, which must be moved about by almost every tide.

The large *Tridacna gigas* is not met with except on the edge of the reef. It is rather common, but not so much so as the former species. There is some confusion about this shell, the name of which is usually referred to Linnæus. But no example was found in his cabinet. His definition agrees with *T. squamosa*, and Mr. Hanley observes that the synonomy quoted is incorrect and leads one to suppose that Linnæus regarded all the various species of *Tridacna* as varieties of one. Mr. Hanley seems also to think that we should restrict the specific name *gigas* to that which is generally regarded as *squamosa*, a change which will hardly be adopted. The animals seem to vary in color, but I had too few opportunities of observing to record much about them. I don't think the beautiful blue and green hues occur in this species. A very common bivalve shell upon the reefs is *Asaphis rugosa*, Lamarck. *Circe crocea*, Lam., is pretty common. The oyster which I regard as *O. cucullata*, Born, is very abundant on the "negro heads" or blocks of dead coral, which project above the rest of the reef. It may be that the cucullate form is an exceptional variety of the common oyster referred to already as existing in such abundance on the rocks at Port Douglas.

On turning over the loose blocks of dead coral, which strew the flat parts of the reef left dry at each tide, a large amount of marine life is revealed. Under nearly every one, the Urchin *Echinometra lucunter*, Leske, is found in groups, two or three together. It varies very much in color. The species are brown-grey, nearly white, or a delicate flesh color. They do not cling to the rock, but move with ease along the ground, keeping the spines erect i a regular "cheveux-de-frise" around them. They are easil handled, however, in spite of their formidable appearance. Bu it is not so with *Echinothrix calamaria*, which is much more rarel met with. This is a very dangerous animal to approach. It i found under stones like the former and presents a rather prett appearance, from its long, rather stout, tapering spines of sea green color, transversely striped with brown. It glides slowl along, moving the spines in all directions. Between these ther are many fine spines, as fine as hair. They are not easily perceive and though so fine and slender, yet they penetrate to great depth into the hand when any attempt is made to seize the annimal. did not know their powers, and at my first effort to secure one go five or six of these spines in my hand, one piercing right throug the side of the finger. It was no use trying to extract them, a they are so fine and brittle. After a few hours they did not caus any inconvenience, and I suppose they must have worked themselves out, for I never felt them afterwards. I am not aware tha this species was found on the Australian coast previously.

Equally uncommon is the urchin *Diadema setosum*, certainly on of the most beautiful of all the species. Those who have onl seen the dried specimens can have no idea of what it is in it natural state. The spines are all of one size, very long an slender of very dark purple color. They spread out in rays al round the test, while the anal tube projects like a large eye, whic in fact most observers suppose it to be. The spines penetrate th hand very easily, but as they are not so fine as in *Echinothrix* the work themselves out in a short time. *Diadema setosum* was noticed by me in a few rock pools, and generally where an overhanging ledge affords some shelter.

The other urchins found on the reef were *Hipponoë variegata*, and *Salmacis rarispina*. The first was always the beautiful bright violet variety, and the second was always denuded of spines. On the beach away from the coral reefs I found *Temnopleurus toreum-*

dicus, and amid the basaltic rocks of Island Point, *Stomopneustes atra-purpurea*, *mihi*, but as I intend to give a separate paper on the *Echini* of this part of the coast and their various habits I shall not refer to them further at present.

In all the rock pools fishes of some sort are found. It would be useless to attempt an enumeration, but I may mention especially the striped *Muræna nebulosa*, and the immense number of young dog-fish or sharks of the genus. Occasionally large specimens of *Conger marginatus*, Forsk., may be seen floundering through the rock pools.

On nearly all the reefs visited by me I found large shallow pools from two to three feet deep at low water, in which there was an extensive growth of coral. The genera were mostly the solid corals, such as *Solenastræa*, *Favia*, *Prionastræa*, *Pavonia*, *Plesiastræa*, *Astræa* (rare) *Meandrina*, *Mussa*, *Symphyllia*, *Hydnophora Galaxea*, *Turbinaria*, *Fungia*, *Pachyseris*, *Turbinaria*, *Pocillopora*, *Seriotopora*, *Psammocora*, *Millepora*, *Heliopora*, *Madrepora*, *&c.* I think that a good many of these are of undescribed species, but the resemblances to known forms are so close that a very careful examination and comparison with typical forms will be necessary before any specific determination is made. *Madrepores* were common in places, but confined to two or three species. I intend to publish in a separate paper what I have to say in detail about the corals. I may remark now that in the pools and lagoons to which I am referring, branched corals were the exception. The common forms were large hemispherical masses or large round flattened slabs like tables. These were for the most part species of *Porites* or *Alveopora*. The flat upper surface was dead and like brown concrete. The thick rounded edge was of rose-pink color generally, and only this part was alive. The cells of this species are so small that the stellate rays can only be seen by a good lens. When undisturbed a kind of tentacular expansion could be observed, a constant movement such as would be caused by the water. A touch of any foreign substance, or a blow caused them to withdraw immediately, and a closed appearance was very manifest over a considerable area of the cells. There must be millions on each one of the round flat tabular masses of *Porites*, which are so common on the reefs. These "tables" are quite loose and can be turned over without difficulty. They are seldom more than a foot thick and the under surface is like the upper.

I have reserved for the last any mention of the *Holothuridæ* which give such a commercial importance to the reefs at the present time. Any detail on the subject of species would require a special essay. So much has been done by observers in Europe —especially northern Europe—that to examine our Australian species under the light of these investigations would be an extensive undertaking. I trust that the time is not distant when it may be done, but I dont think it can be done unless on the reefs themselves, where anatomical examinations of the living examples will alone furnish the required facts. I merely record now that the species collected in abundance are those classified as *Trepang* by G. F. Jaeger, in 1833 in the well known essay De Holothuriis.* The genus is not adopted, and has no better definition from its author than "body sub-cylindrical, mouth anterior, surrounded by ten to twenty petately capitate tentacles." He enumerates four, viz. *Trepang edulis*, *T. ananas*, *T. impatiens*, and *T. peruviana*. The first of these is certainly found on the reefs, and is called by the fishermen "red fish." It is an elongated oval, somewhat shapeless mass of dull, reddish-brown color, and covered all over with papillary suckers. It is eight or ten inches long and very heavy. Next to this is the "tit-fish," a somewhat smaller species of elongated shape, black in color, and studded with somewhat distant, large tentacles, which project nearly an inch or so. Another species is the "milk-fish," or "cotton-fish," so called from its power of emitting a white viscid fluid from its skin, which clings to any object like shreds of cotton. The fishermen do not use it, and it is said that the white fluid stings the skin. There are many other species which have not been named or described, nor do I think they can be until they are studied in the living state, at least according to the present system of classification. They are found in large numbers crawling over the reefs at low tide. No doubt the extensive way in which the edible species are gathered will make them scarce. and some are beginning to get scarce at certain portions of the reef, But the enormous extent of coral reef, not only on the Barrier, but in the islands enclosed within the Barrier, renders it very easy for the fishermen to seek new grounds for their operations.

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* De Holo. Dissertatio inaug. Turici, 1833, 4 to with plates.

A very common species on the island reefs which I visited, is *Synapta Besellii*, Jaeger, or an allied form. This is said to be an inhabitant of Celebes, but no doubt has a wide range. One cannot mistake the genus for any other. Immediately on putting one's hand on it, the animal adheres to the skin. With a very ordinary lens the skin is seen to be covered with small spicules, shaped like an anchor. With these the animal adheres readily to any soft object. These anchors have the heads fixed in a round calcareous plate imbedded in the skin. This accounts for the numbers of small perforated, calcareous disks which strew the reefs, and look just like shirt buttons. Mr. Moseley, in his "Naturalist Voyage of the Challenger" mentions this animal, and states how the anchors in the skin were favorite objects for microscopic exhibition to visitors. It was thought by sight-seers to be one of the most important discoveries of the Expedition, and got in consequence the name of the "Admiralty Worm." Otto Semper mentions having seen one *Synapta (Bessellii ?)* at the Philippine Islands, 6 ft. long. When fully extended on the reefs near Port Douglas, a length of four feet was not unusual. They are often mistaken for water snakes. The anchors on the skin easily break, and the animal does not seem to have any control over them. They serve for the purposes of locomotion in connection with the voluntary contractions of the muscles.

Properly speaking the *Synaptidæ* are the only "lungless" family of the *Holothuriæ*. Semper mentions two others,[*] the *Eupyrgidæ* and the *Oncinolabidæ*, both containing only one genus, but all the species according to Theel[†] have lungs or the evidence of the absence of these organs is doubtful. The definition of *Synapta* according to the same author is as follows. Body more or less vermiform, cylindrical, without feet or ambulacral areas along the body, hermaphrodite, calcareous concretions in the skin either wanting or forming anchors and wheels.

I have been able to make some observations on the development of the young of this species, but these and some other remarks on this part of the reef fauna I must reserve for a future occasion.

On every portion of the coral islands on the Barrier *Ophiuridæ* were very abundant. Their long arms might be seen protruding from under almost every block of coral; the bodies were generally concealed. One species in particular with very long arms I took to be *Ophiocoma scolopendrina*, Lam., *Ophioglyha Kinbergi*, Ljungman and *O. multispina*, are both Port Jackson forms, but I fancy allied species are represented in the coral regions. *Ophiolepis annulosa* is common, as also *Ophiocoma erinaceus*, Mull. and Tros., and *O. lineolata*, Mull. and Tros., who give it as *O. pica*. I also saw species which I referred to *Ophiomastix annulosa*, Mull. and Tros. (p. 107) *Ophiothrix longipeda*, Lam., (Mull. and Tros. p. 113) *O. nereidina*, (Mull. and Tros. 115) Lamarck (p. 224, vol. 3, 2nd edit.) *Ophiocnemis marmorata*, Lam., p. 223, and Mull. and Tros., p. 87. Some of these identifications are doubtful and the whole of the species noticed by me need revision, a work which I hope to effect in detail hereafter.

It is very curious to watch the manner in which these starfishes ply their search for food. The long arms are extended from the smallest possible holes or cracks from whence the cirrhi can be seen moving in the water. Any foreign object is rapidly seized and conveyed to the mouth, though I could not ascertain what was their favorite food. They are very easily captured. By turning over any block of dead or living coral four or five of them will be seen slowly moving away. The fishermen seem to have a dread of them, so they are quite unmolested, except by the naturalist or whatever marine enemies they may have.

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[*] Reisen in Archipel der Philipinea I. Holothuriea 1, p. 8.

[†] Holoth. des Mers N. Zemble. Upsal 1877.

In the preceding observations only a few of the objects of interest on our coral reefs have been touched upon. To deal with all would require many volumes instead of essays. When we remember what the sea coast is to the naturalist, we may form an opinion of what a coral reef must be. The whole structure is the result of animal activity, and every portion on which the eye rests reveals some new phase of animal life. We may take it as certain that only a very small portion of our reefs have been explored by naturalists, and that therefore there is no more promising field of zoological discovery in the whole world, none where the interest is greater, or where distinction may be more easily won. For my own part the few weeks I spent in the coral region were the most intensely interesting of any I remember in a life-time of observation as a naturalist, and I trust that one result of my few scattered notes will be to attract others on to the same enchanting field.

RECTIFICATION OF THE NOMENCLATURE OF *Purpura anomala*, ANGAS.

BY PROFESSOR RALPH TATE, PRESIDENT PHIL. SOC., ADELAIDE, &C.

South Australian specimens of a species of marine gasteropod, forwarded to Mr. G. F. Angas, F.L.S., under the generic title of *Mangelia*, have lately been returned to me with the name of *Purpura (Cronia) anomala*, Angas. The description and figures of that species, Proc. Zool. Soc., 1877, pl. v., fig. 1., are truly applicable to the shells above referred to. The form of the columella is valid reason for the removal of the species from the famil *Purpuridæ;* and as in well-preserved adult specimens, a very sho sinus exists, the species should have a place in that of *Pleurotomid* In the absence of the notch on the outer lip, the well-defin flexure of the striæ of growth is alone sufficient to justify i transference from the one family to the other. The position the sinus and other external features permit its reception in t genus *Mangelia*, and it should, henceforth, be known as *M. anomal* Indeed its affinity to *M. Vincentina*, Crosse, is sufficiently close necessitate close comparison to separate extreme forms of ea from one another.

South Australian examples are for the most part of an opaq white, with black blotches, between the costæ, at the anteri suture and on the middle line of the last whorl; but a few, wi thinner tests, exhibit the more elaborate markings which belo to the type specimen.

M. anomala is a rare shell in South Australian waters, thou I have gathered it, from among shell sand, at widely separat localities, thus:—Aldinga Bay and Salt Creek, east and west sid of St. Vincent's Gulf, respectively; Wauraltie, east side of Spence Gulf; and Fowler's Bay, Great Australian Bight.

DESCRIPTIONS OF AUSTRALIAN MICRO-LEPIDOPTERA.

By E. Meyrick, B.A.

III. TINEINA.

In the following paper I have described forty-seven species the least-developed families of the *Tineina;* five of these h been previously described, the remaining forty-two are new science. One only out of the whole (*Bedellia somnulentella*, occurs elsewhere, being common to Europe and North Ameri though it is now difficult to say whether it has or has not been introduced by man into this and other countries: the rest are all endemic.

The families here treated of form (with the addition of the genus *Nepticula*, of which I am acquainted with at least fifteen Australian species, though not yet prepared to describe them,) a natural group, sharply terminated at both ends, though admitting of a wide range of structural variation. The materials collected are sufficient to give a fairly accurate conception of the form in which the group appears in this region, and enable me to make a few remarks upon the classification and order of development of the genera. Excluding *Nepticula*, these are generally classed in three families,—*Gracilaridæ*, *Lithocolletidæ*, and *Lyonetidæ*. Wocke has wished to split up the *Lyonetidæ* into two or more families, on the ground of differences in neuration, but this seems very unnecessary. I am clear, however, that *Lithocolletis* and its allies cannot be kept apart from the *Gracilaridæ*, with which they agree in the structure of the head, and especially in respect of the fourteen-legged larva, found in no other *Tineina*, and of the larval habits. There are however a few very small genera (*Tischeria*, *Bedellia*, *Urodeta*, *Arctocoma* (described hereafter), and perhaps *Oenophila*, of which the larva is hardly known) which are sometimes referred to the *Lithocolletidæ*, and sometimes to the *Elachistidæ* but do not agree with either, being separated from the former by the sixteen-legged larvæ, and from the latter by the roughly tufted head. I would place these in a separate family, which I have below called *Bedellidæ*, a step which appears to me to be in accordance with nature, and to simplify the systematic discrimination of the families. The *Lyonetidæ* form a natural group, distinguished from both the preceding by the basal joint of the antennæ expanded into an eyecap. The *Nepticulidæ* also possess the eyecap, but have well-developed maxillary palpi, peculiar neuration, and larvæ with 18 imperfectly developed pro-legs, not found elsewhere in the *Tineina*.

For rightly understanding the process of development a careful comparison of the fauna of other regions is required, and the *Micro-Lepidoptera* have been as yet very partially studied. It is possible, however, to make a fair comparison with the region which Mr. Wallace has called Palaearctic, so far as it is represented by Europe, and with North and South America to a less extent; and to make use of a few fragments of positive evidence from other countries, with the following results. I should premise that these minute *Micro-Lepidoptera*, from their extreme delicacy, fragility, and defencelessness, from their lacking the rapid and powerful means of locomotion of butterflies and large moths, and from the usually very short term of their lives, afford excellent material for the study of geographical distribution.

The well-marked generic differences of structure, and the fixity of type in most cases, are very conspicuous in these lowest families and are evidences of a hoary antiquity. In no genus is this more evident than in *Nepticula*, which is represented apparently all over the world in equal proportion, by numerous species which have everywhere an extreme resemblance to one another. Of the other genera in these families *Bucculatrix*, *Opostega*, *Phyllocnistis*, *Coriscium*, and *Gracilaria*, appear to have also a practically world-wide range. Of some of the other genera, which have but few species, it is not yet safe to say where they may not be found. There is however one extensive genus which is interesting by its entire absence from the Australian region, namely *Lithocolletis*, of which I could not have failed to find traces if it had existed here. (I may observe here, that the insect described by Newman as *Lithocolletis lalagella*, (Trans. Ent. Soc., Lond., Vol. III., N. S., 300) is certainly a *Gracilaria* allied to *G. caenotheta* and *autadelpha*, but not accurately identifiable. This genus comprises a very large number of species in Europe, and North and South America, and is also known to occur in India; most forest trees have one or more species attached to them, and of many the individuals in extreme profusion, showing that throughout this range of climate they are a dominant race. No reason can be assigned why the genus should not occur in Australia, except that it must have come into existence since the time when Australia was last in immediate communication by land with the continent, when it obtained its original supply of *Mammalia*, which is believed to carry us back to somewhere near the close of the Secondary period. Now *Gracilaria*, which is more highly organised, and would be generally regarded as a development of *Lithocolletis*, is found evenly distributed over the whole world, as stated above. It appears to me to follow from this that *Lithocolletis* came into existence much later than *Gracilaria*; and that if, as from their close alliance seems almost certain, one was developed from the other, it was *Lithocolletis* which is a degraded development of *Gracilaria*. It would appear also that the same is true of *Ornix*; whose cone-rolling larvæ should be noticed in connection with the cone-rolling larvæ of the higher *Gracilariæ* in Europe and North America, as it is very probable that the habit is of late development. *Coriscium*, though possessing few species, is apparently contemporaneous with *Gracilaria*. The rest of the family consists at present of three small North American genera, of which I am only able to say that they are allied to *Lithocolletis*. The ancestral form of the family may therefore be regarded as a form corresponding very nearly to the smaller species of *Gracilaria*.

Turning now to the *Bedellidæ*, we find them to be a very small group, yet having distinct affinities with the *Gracilaridæ*, the *Lyonetidæ*, and though *Elachista* with the *Elachistidæ*. They may probably be the last surviving representatives of a once wider family. As in their case there is at present but little available material, I will not force conclusions; but it seems likely that we may have here the nearest existing approach to the original organisms from which the above-mentioned three families took their rise. The commonly swollen basal joint of the antennæ points to the source of the eyecap in the *Lyonetidæ*; and the attitude of the imago in *Bedellia* (preserved also in *Tischeria*) is a rudiment of the peculiar position assumed by a *Gracilaria*.

The *Lyonetidæ*, though a very natural family, have a very wide range of structure in respect of the head and the neuration. *Stegommata* and *Lyonetia* are very nearly allied, and might well be considered sections of one genus. Regarding them so, then *Bucculatrix*, *Crobylophora*, and *Stegommata* would form a natural group in the family, distinguished by the roughly tufted head. *Opostega* and *Cemiostoma* are also naturally associated, and *Phyllocnistis* appears by its quite smooth head and apodal larva to be an extreme development of these. *Atalopsycha* may perhaps be intermediate between the two groups, but it could not yet be safely affirmed. Most of these genera, though small, are of universal range, and the others are known as yet merely as small local developments, so that nothing can yet be predicted from the facts of their geographical distribution. I am disposed to think, hovever, that *Bucculatrix*, which is the largest of them, and also the most persistent in type, is probably the oldest, and nearest to the original form. It is also the nearest to the *Nepticulidæ*, which we are probably justified in regarding for the present as a very ancient but degenerate development of *Bucculatrix*, or rather of the progenitors of *Buccalatrix*.

In the preceding remarks I have been twice led to assert that a more lowly organised form has been derived from a higher, and I have reason to believe, as in subsequent communications I hope to show, that this has taken place more commonly than is often supposed. Such examples are not, however, as a superficial observer might suppose, a violation of the law of improvement under natural selection. According to the principle of evolution any change may occur if beneficial, and the degradation, and consequent simplification, of an organism must often be as great a benefit, as its complication at the cost of increased requirements. It will, I think, be in practice rarely found that the lowest organised species or genus of a group is the nearest to the immediate ancestor of the whole group.

Subjoined is an analytical table of the genera hereafter referred to, which may be an assistance to their ready identification.

A.—basal joint of antennæ not forming an eyecap.
  a.—head with appressed scales.
    1. second joint of palpi smooth or rarely loosely scaled beneath .. .. Gracilaria
    2. second joint of palpi with a projecting tuft .. .. Coriscium
  b.—head shortly rough-haired; antennæ longer than forewings .. .. Epicephala
  c.—head roughly tufted above.
    1. antennæ as long as fore-wings; hind-wings linear .. .. Bedellia
    2. antennæ shorter than fore-wings; hind-wings lanceolate .. .. .. Arctocoma
B.—basal joint of antennæ dilated into an eyecap.
  a.—head roughly tufted above.
    1. antennæ longer than fore-wings .. Stegommata
    2. antennæ shorter than fore-wings.
      * labial palpi developed .. .. Crobylophora
      ** no labial palpi .. .. .. Bucculatrix
  b.—head roughly short-haired in front, smooth behind .. .. Opostega
  c.—head with appressed scales; hind-wings lanceolate .. .. Atalopsycha
  d.—head smooth, glossy; hind-wings nearly setiform .. .. Phyllocnistis

GRACILARIDÆ.

GRACILARIA, Z.

Head smooth; no ocelli; tongue long. Antennæ as long or longer than fore-wings, slender, filiform. Maxillary palpi rather long, filiform. Labial palpi moderately long, ascending, arche slender, cylindrical; second joint smooth, sometimes loosely scale beneath, terminal joint nearly as long as second. Fore-win elongate, very narrow, parallel-sided, costa bent at apex or even pointed. Hind-wings very narrowly lanceolate, much narrow than fore-wings, cilia thrice or four times as broad. Abdome elongate, slender. Legs long, slender; middle tibiæ often muc thickened with scales. Fore-wings with 12 or 11 veins, 5 branch to costa, no secondary cell, 1 simple. Hind-wings with from to 6 veins, 3 and 5 being sometimes obsolete; 5 and 6 stalke cell open.

This genus is of world-wide occurrence, about seventy speci being hitherto known. All the species are elegant and some great beauty; when at rest they sit with the forepart much raise and the two anterior pairs of legs, which are often elegant marked, conspicuously displayed. They are somewhat retired i habit, and may often be easiest found at rest on fences.

The larvæ are fourteen-legged, slender, always mining in leav when young; afterwards many of the European and America species construct hollow cones for habitations, by rolling up piec of the leaves they feed on; others remain miners all their lif All the Australian species, with the larvæ of which I am acquainte are miners throughout life, nor have I ever seen indications of th familiar cones of this genus in Australia. The mining larv usually leave the mine in order to form their cocoon.

The genus is well-marked and easy of recognition, but som slight variations of structure are found within its limits, principall in respect of the scaling of the middle pair of tibiæ, and th second joint of labial palpi: the gradations are however insensible, that they do not admit of breaking up the genus their means. The twenty-nine species here described may tabulated as follows:

A.—middle tibiæ very much thickened throughout with scales.

a.—fore-wings dark purple-fuscous .. 1. œnopella
b.—fore-wings reddish-ochreous
  1. with a double yellow costal triangle 2. xanthopharella
  2. with costa broadly yellow.. .. 3. adelina
c.—fore-wings pale ochreous, costa broadly white .. .. 4. auchetidella

B.—middle tibiæ slightly (often unevenly) or not thickened.
a.—fore-wings yellow with central crimson streak .. ..15. ethela
b.—fore-wings crimson with yellow or white markings.
  1. head pale yellow ; 6 costal streaks 16. formosa
  2. head white ; 7 costal streaks ..17. ida
c.—fore-wings metallic coppery-green or bronze.
  1. with two white spots .. ..14. chalcoptera
  2. with 4 costal and 4 dorsal streaks 22. eumetalla
d.—fore-wings unicolorous dark slaty-grey 5. æthalota
e.—fore-wings white with fuscous or ochreous markings.
  1. inner margin brownish-ochreous..18. mnesicala
  2. inner margin white.
    * antennæ wholly white ..20. aëllomacha
    ** antennæ annulated with dark fuscous .. .. ..19. lyginella
f.—forewings ochreous with grey markings 6. plagata
g.—fore-wings ochreous or grey with white markings.
  1. with straight transverse fasciæ and marginal spots.
    * fasciæ spotted with black .. 8. ordinatella
    ** fasciæ not spotted, alternating with black transverse clouds 7. lepidella

*** fasciæ not spotted, without black clouds.

† with one fascia and four spots 12. **hoplocala**
†† with one fascia and five spots . . 13. **calicella**
††† with two or three fasciæ.
‡ thorax greyish-ochreous . . 9. **tricuneatella**
‡‡ thorax white.
§ third fascia represented by two opposite nearly equal spots . . 11. **cænotheta**
§§ third fascia entire, or if interrupted, lower spot much the larger . . . . . . 10. **autadelpha**

2. with a longitudinal, inner-marginal streak and marginal spot.

* with five costal streaks . . 24. **alysidota**
** with two costal streaks.
† head and inner-marginal streak ochreous . . . . . . 25. **ochrocephala**
†† head and inner-marginal streak brassy-white . . . . 26. **nereïs**
††† head and inner-marginal streak pure white.
‡ streak along inner-margin itself 27. **didymella**
‡‡ streak separated from inner-margin by a streak of ground colour . . . . . . 28. **laciniella**

3. with both margins irregularly white 29. **albomargina**

4. with marginal spots only.

* fore-wings golden-ochreous, clouded with dark bronze . . 23. **eupetala**
** fore-wings pale clear greyish-ochreous . . . . . . 21. **thalassias**

Grac. œnopella, *n. sp.*

♀. 4‴. Head and thorax very dark fuscous; maxillary palpi whitish, apex of joints fuscous; labial palpi dark fuscous, internally ochreous-whitish. Antennæ longer than fore-wings, dark fuscous. Abdomen dull ochreous-grey. Legs ochreous-whitish, tarsal joints fuscous at apex; anterior tibiæ dark fuscous above; middle tibiæ very much thickened, dark purplish-fuscous. Fore-wings very dark purple-fuscous; a faint whitish fascia from before middle of costa, rather oblique outwardly; a few pale scales at apex; cilia dark grey, blackish round apex of wing. Hind-wings and cilia dark grey.

One specimen bred in May from larvæ found commonly in the Botanical Gardens, Sydney; the food-plant is native to Australia, but appears to grow north of Sydney.

Larva pale yellowish, feeding in a flat irregular blotch, originating in a slender gallery, beneath upper surface of leaves of *Tetranthera ferruginea, (Laurineæ)* in April. Pupa in a white cocoon beneath the turned down corner of a leaf.

Grac. xanthopharella, *n. sp.*

♂ ♀. 5‴-5½‴. Head above and thorax ochreous-reddish tinged with purple, face and maxillary palpi pale yellow. Labial palpi pale yellow, extreme apex dark fuscous. Antennæ longer than fore-wings, ochreous-reddish above, yellowish beneath, with darker annulations. Abdomen pale ochreous, suffused above posteriorly with fuscous-grey. Legs pale ochreous-yellow; anterior and middle tibiæ dark purplish-red fuscous, middle tibiæ much thickened; posterior tarsi with the two apical joints very narrowly dark fuscous at base. Fore-wings reddish-violet, partially tinged with ochreous; a small, very oblique, rather oval, pale yellow spot near base, its lower end reaching the fold; a large pale yellow costal triangle, rather before middle, its apex almost reaching inner margin, its upper angle produced along costa as a semiovate patch, reaching nearly to apex; a few yellow scales at anal angle; cilia fuscous-violet round apex, containing a reddish-yellow patch below apex, and with three indistinct blackish lines, thence fuscous-grey. Hind-wings and cilia fuscous-grey.

Scarce; occurs at Sydney and Parramatta from November to February, flying in the sun. Allied to the group of *alchimiella*, Sc., and apparently nearest to the North American *superbifrontella* Clem., but not to be mistaken.

Grac. adelina, *n. sp.*

♂ ♀. 6‴. Head and thorax ochreous-reddish with violet reflections, face snow-white. Maxillary palpi whitish, externally ochreous-reddish. Labial palpi reddish-ochreous, white at base, lower half of terminal joint externally purple-fuscous. Antennæ longer than fore-wings, pale reddish-ochreous, annulated with dark fuscous. Abdomen fuscous-grey, pale ochreous at base, beneath metallic-yellow. Legs pale ochreous; anterior tibiæ blackish; middle tibiæ very much thickened, deep reddish suffused with violet black. Fore-wings deep reddish-ochreous with violet reflections, with a very broad, pale metallic-yellow costal band, covering more than half the breadth of wing, and extending almost from base to apex; the ground colour sends a conical projection into this band before middle, cutting half through it, and midway between this and base is a much shorter, obtuse projection, both suffused with deep cobalt-blue; the lower ⅔ of the reddish-ochreous inner-marginal portion is marked from base to apex with regular, transverse strigulæ of brilliant deep cobalt-blue, appearing black in some lights; cilia reddish-ochreous round apex, thence dark fuscous-grey. Hind-wings and cilia dark fuscous-grey.

This magnificent species is unsurpassed in the elegance and intensity of its colouring. I took one pair in dense swampy forest in January, near Hamilton, on the Waikato, New Zealand. It seem to be nearly allied to the North American *violacella*, Clem., and *blandella*, Clem.

Grac. auchetidella, *n. sp.*

♀. 4½″-5″. Head and thorax whitish-ochreous mixed with grey. Maxillary palpi white. Labial palpi white, apex of second joint and a broad ring before apex of terminal joint black. Antennæ whitish-ochreous, annulated with black. Abdomen pale greyish-ochreous. Legs pale ochreous, joints of tarsi very narrowly black at base; anterior tibiæ black; middle tibiæ very much thickened with black scales. Fore-wings with costal half whitish, dorsal half and hind-margin pale ochreous, irrorated sparsely throughout with blackish scales, and densely along a longitudinal dilating streak from base to apex; these scales tend to form regular transverse strigulæ on costal and dorsal margins; on the white costal half is a broad central pale ochreous transverse perpendicular fascia, densely irrorated with black; cilia fuscus-grey, with three indistinct black lines round apex. Hind-wings fuscous-grey, cilia paler, tinged with ochreous at base.

Allied to the preceding, but very different. Two specimens beaten in October from the dense subtropical forest near the top of the Bulli Pass, Illawarra, 1,500 feet above the sea.

Grac. æthalota, *n. sp.*

♂. 4½″. Head glossy dark grey, face paler. Labial palpi whitish, apex of second joint and a subapical ring of terminal joint black. Antennæ longer than fore-wings, grey-whitish, with evanescent fuscous annulations. Thorax and abdomen dark fuscous-grey. Legs whitish, tarsal joints suffused with pale fuscous except an apical ring, anterior and middle tibiæ not thickened, suffused with fuscous above. Fore-wings unicolorous dark glossy slaty grey, with one or two pale scales at apex; cilia dark fuscous, with three obscure blackish lines round apex, and a whitish hook. Hind-wings and cilia dark fuscous-grey.

Not apparently nearly allied to any described species; superficially it seems to belong to the preceding group, but differs in the middle tibiæ being quite slender. One specimen beaten from forest near Dunedin, New Zealand, in January.

Grac. plagata, Stt., Trans. Ent. Soc., Lond., Vol. I., 3rd Ser.

"5½‴. Head greyish-ochreous. Maxillary palpi white, spotted with dark fuscous. Labial palpi white, base of second joint and two spots on terminal joint dark fuscous. Antennæ pale fuscous, with darker annulations, basal joint pale ochreous-grey in front, dark fuscous behind. Thorax greyish-ochreous. Legs white, tarsi spotted with dark fuscous, anterior and middle tibiæ dark brown. Fore-wings greyish-ochreous, faintly olive, with an oblique darker fascia beyond middle, followed by a large irregular blue-black blotch; before the apical black spot is a slender whitish fascia, perpendicularly placed; basal portion of wing rather irregularly marbled with darker, the first defined marking being the oblique fascia, which is anteriorly edged with blackish, and broadest on inner margin; the blotch beyond this begins on the disc, sharply edged with black; it then extends to the costa on which it is of considerable breadth, enclosing a small costal spot of the pale ground-colour; it slopes gradually towards inner margin, reaching it just at anal angle, its outer edge pretty well defined with black scales and followed immediately by a slightly oblique fascia of the pale ground-colour towards the costa but much suffused towards inner margin; this is followed by a fuscous patch nearly of the colour of the central fascia, intersected by an oblique, black streak, beyond which is the slender, perpendicularly placed, dark-margined white fascia; a minute, black apical spot; cilia olive-brown, paler towards tips, intersected by two blackish lines, on inner-margin dark grey. Hind-wings dark grey, cilia grey."

The above is Stainton's original description, accompanied by a figure, and taken from a single specimen. said to be from the neighbourhood of Brisbane. The species appears to be somewhat allied to *syringella*, F., and intermediate between the two main divisions of the genus; I have not met with any specimens coming at all near the description, so that it is probably a subtropical species.

Grac. lepidella, *n. sp.*

♂. 3¼″-4¼″. Head and thorax whitish-ochreous or white mixed with fuscous. Maxillary palpi whitish-ochreous, second joint black. Labial palpi whitish-ochreous, second joint and a median ring of terminal joint blackish. Antennæ slightly longer than fore-wings, whitish-ochreous, annulated with dark fuscous. Abdomen whitish-ochreous. Legs whitish, anterior and middle tibiæ somewhat thickened, blackish; tarsal joints with black apical rings, broadest on basal joint, basal joint of posterior tarsi also with broad black median ring. Fore-wings brownish-ochreous, clouded with black, and with two fasciæ and four spots white, confusedly black-margined; first spot on inner margin near base, large, irregular, meeting a blackish cloud on costa; first fascia at ¼, second in middle, both rather narrow, straight, perpendicular; intermediate between them is a transverse fascia-like blackish cloud, and another similar one beyond second fascia, distinct and clearly margined posteriorly, meeting the very small second spot on anal angle; third spot on costa beyond ¾, small, wedge-shaped, broadly margined posteriorly by a black subapical fascia from costa to hind-margin; fourth apical, somewhat fascia-like, extending into cilia above apex; cilia pale fuscous-grey, with four irregular black lines round apex. Hind-wings and cilia fuscous-grey.

Not closely allied to any known species. Two specimens taken on a fence near Sydney, in September and January.

Grac. ordinatella, *n. sp.*

♀. 4″. Head and thorax ochreous-white. Maxillary palpi whitish, terminal joint fuscous. Labial palpi whitish, a broad apical ring on second joint, a median and an apical ring of terminal joint dark fuscous. Antennæ ochreous-white, becoming obscurely dark fuscous at apex. Abdomen above fuscous-grey, beneath white with black rings. Legs white; anterior and middle tibiæ somewhat thickened, base narrowly and apex broadly black, tarsi with two black rings; posterior tibiæ stiff-haired above, with median and apical black bands. tarsi with bases of joints narrowly and centres of first and second joints broadly black-banded. Fore-wings greyish-ochreous, irrorated with blackish, along costa suffused with blackish, with three fasciæ and two spots, white spotted with black and edged with black scales; first fascia at ¼, perpendicular, broader on inner margin and suffusedly produced on inner margin towards base, containing costal, discal, and dorsal black spots; the basally produced portion projects across disc close to base, between which and the fascia is a white dot below costa; second fascia from costa slightly before middle, outwardly oblique, evenly broad, irregularly margined, containing large subcostal and discal black spots, and a few black scales on inner margin; third fascia from costa slightly before ¾, parallel to second, narrower, and partially interrupted on disc, containing large subcostal black spot; a small irregular partially black-centred costal spot at ⅚; a rather large apical spot, containing a few black scales; cilia dark fuscous-grey, with a blackish line round apex. Hind-wings dark fuscous, cilia fuscous-grey.

Somewhat allied to the preceding, but distinguished from all by the black spots in the white fasciæ; *quadrifasciata*, Stt., from India (bred from *Urena lobata)* seems from the figure to be an allied species. One specimen on a fence near Sydney in June.

Grac. tricuneatella, *n. sp.*

♂ ♀ . 4″. Head and palpi snow-white, apex of maxillary palpi dark fuscous; labial palpi with apex of second joint and a subapical ring of terminal joint dark fuscous. Antennæ longer than fore-wings, dark fuscous with faintly paler annulations, basal joint white. Thorax greyish-ochreous. Abdomen dark fuscous, beneath whitish. Legs white; anterior tibiæ black with white basal and median bands, middle tibiæ slightly thickened, black with white median band, posterior tibiæ with narrow basal and broad median black bands, all tarsi with four black bands. Forewings moderately dark greyish-ochreous, with three sometimes confluent wedge-shaped fasciæ and two spots snow-white, black margined; first and second fasciæ very narrow on costa, rapidly dilating, very broad on fold, narrower on inner margin, second more oblique; third oblique, formed by union of very small costal spot and very large dorsal triangle; these three are sometimes confluent along fold; a small costal spot before apex, produced as an oblique narrow streak to hind-margin; a small apical spot, extending into cilia; cilia round apex whitish, with two partial black lines, thence pale grey. Hindwings and cilia fuscous-grey.

Distinguished from the allied species by the greyish-ochreous thorax and strongly dilated fasciæ. The imago is retired in habits; taken sparingly in April on the creek at Parramatta amongst its foodplant, and also bred.

Larva tapering posteriorly throughout, segments deeply incised; dull yellowish, tinged with greenish-grey, each segment with an irregular, oblong transverse, blackish-green dorsal spot; head black, with a pale line on each side meeting behind; anal segment very small, blackish. Feeds in irregular flat whitish blotches beneath upper surface of leaves of *Typha latifolia (Typhaceæ)*, in March. Pupa inside the mine in an oval flattened cocoon.

Grac. autadelpha, *n. sp.*

♂ ♀. 3¼"-3¾". Head, thorax, and palpi snow-white, terminal joint of labial palpi with slender black basal and subapical rings. Antennæ longer than forewings, dark fuscous, whitish at base, basal joint white with black apex. Abdomen dark fuscous, anus white, beneath white with slender black rings posteriorly. Anterior tibiæ blackish, with indistinct basal and median whitish rings, tarsi white with two dark fuscous bands; middle tibiæ somewhat thickened, blackish with broad white median band, tarsi white with two dark fuscous bands; posterior tibiæ dark fuscous with narrow basal and broad median white bands, tarsi white with four dark fuscous bands. Fore-wings deep ochreous-grey, with three straight fasciæ and two spots snow-white, black margined; base narrowly white; first fascia very broad, almost as broad on costa as on inner margin, outer edge irregular; second fascia less broad, not oblique, irregular-margined, rather broadest on inner margin; third oblique, very broad on inner margin, very narrow on costa, strongly contracted below costa, rarely interrupted, but if so, costal spot minute, dorsal very large; a small costal spot before apex, indistinctly obliquely produced to hind-margin, sometimes obscured with black scales; an ovate apical spot, extending into cilia; cilia whitish round apex, with a black line, thence fuscous-grey. Hind-wings fuscous-grey, cilia paler.

Differs from *tricuneatella*, especially by the white thorax; very closely allied to the succeeding *cænotheta*, easiest distinguished by the white basal joint of antennæ and different shape of fasciæ. Frequents dry scrub; the larva is no doubt attached to one of the *Proteaceæ*, probably to a *Banksia;* the food plant of *cænotheta* does not grow where this species has been taken. Scarce; in the bush near Sydney, in February and March.

Grac. cænotheta, *n. sp.*

♂ ♀. 3½''-4''. Head and palpi snow-white, terminal joint of labial palpi with slender, black, basal and sub-apical rings. Antennæ longer than fore-wings, grey-whitish towards base, becoming bark fuscous towards apex, basal joint black. Thorax white, anterior margin narrowly black. Abdomen blackish, anus white, beneath with white rings. Anterior tibiæ black, with indistinct basal and median whitish rings, tarsi white with two black bands; middle tibiæ somewhat thickened, black with broad median white band, tarsi white with two black bands; posterior tibiæ black with narrow basal and broad median white bands, tarsi white with four black bands. Fore-wings deep ochreous-grey, with two strait fasciæ and four spots snow-white, black margined; base narrowly white; first fascia broad, dilating from costa to inner margin, outer edge irregular; second much narrower broadest on inner-margin, slightly cblique outwardly; a small costal spot at ¾ and a rather larger one somewhat beyond it on inner margin, nearly meeting; a smaller costal spot immediately before apex, produced by black scales obliquely to hind-margin; a rather large ovate apical spot, extending into cilia; cilia greyish-ochreous beneath apex, with a black line, thence fuscous-grey. Hind-wings fuscous-grey, cilia paler.

Very close to the preceding species, but the basal joint of antennæ is black above, and the third fascia is always represented by two not very unequal opposite spots. The Indian *terminaliæ*, Stt., belongs to this group, but the third fascia is represented by a costal spot only; it was bred from *Terminalia catappa*. The imago of *cænotheta* is retired in habits, and I have only once taken it; I bred several from the larvæ, which are not uncommon; I have only found the species at Blackheath on the summit of the Blue Mountains, 3,500 feet above the sea.

Larva yellowish, (undescribed); feeds in a large irregular whitish blotch in upper surface of leaves of *Telopea speciosissima (Proteaceæ)*, the well-known "Waratah"; the mine is at first flat but later the upper epidermis contracts and causes the formation of a hollow chamber, somewhat similar to the mines of the genus *Lithocolletis*, but much larger in proportion. Pupa in an ochreous cocoon, outside the mine.

Grac. hoplocala, *n. sp.*

♂ ♀. 3¾″-4″. Head and palpi snow-white, apex of second joint of labial palpi faintly grey. Antennæ dark fuscous with faint paler annulations, basal joint white. Thorax white, lateral margins golden-brown. Abdomen fuscous-grey, beneath white with dark bands. Legs white, anterior tibiæ blackish with a white spot, middle tibiæ slightly thickened with black median and apical bands, posterior tibiæ stiff-haired with blackish apical and subapical bands, all tarsi with five black rings. Fore-wings rather pale golden-brown, with a fascia and four spots snow-white black-margined; first spot on inner margin almost at base, black-margined externally only, fascia-like, rather oblique, not reaching costa, indistinct above; fascia before ⅓, somewhat oblique inwardly, narrow on costa, gently dilated to fold, where it is much less broad than in *calicella*, thence parallel-sided; second spot on costa before ⅔, very small; third very large, acute-triangular, on inner margin at anal angle, its apex only separated from second spot by the black margins; fourth forming an oblique subapical streak from costa to middle of hind margin; cilia fuscous-grey, with two black streaks radiating from apex at an obtuse angle, the lower produced backwards into white costal cilia. Hind-wings and cilia fuscous-grey.

Allied to the three preceding species, but with only one complete fascia; very nearly allied to the following *calicella*, Stt., but immediately known by the absence of one of the costal spots, as well as the narrower fascia. Taken rather freely on a fence in Sydney in October, during windy weather; the larva is probably attached to some species of *Eucalyptus*.

Grac. calicella, *Stt.*, Trans. Ent. Soc. Lond., Vol. I., 3rd Ser.

♂ ♀. 3¾″-4¼″. Head and palpi snow-white, apex of second joint of labial palpi faintly grey. Antennæ dark fuscous, faintly annulated with paler, towards base whitish. Thorax snow-white lateral margins ochreous-brown. Abdomen fuscous-grey, beneath white with narrow dark bands. Legs whitish, anterior and middle tibiæ slightly thickened, with black median and apical bands, posterior tibiæ stiff-haired, all tarsi with five black rings. Fore-wings rather pale golden brown, with a fascia and five spots snow-white, black margined (except first); first spot on inner margin almost at base, not blackmargined, fascia-like, very oblique, not reaching costa, above indistinct; fascia before ⅓, very narrow on costa, very rapidly dilated and extremely broad on fold, where its outer edge is angulated inwards to inner margin; second spot on middle of costa, small, outwardly oblique; third on costa beyond it, much slenderer, rather less oblique; fourth broadly triangular on inner margin at anal angle, united to third by a small black cloud; fifth forming an oblique subapical streak from costa to middle of hind-margin; cilia fuscous-grey, with two black streaks radiating from apex at an obtuse angle, the lower produced backwards into white costal cilia. Hind-wings and cilia fuscous-grey.

Closely allied to the preceding species, but recognisable by the additional spot in middle of costa, and the more strongly dilated fascia. I have little doubt that my specimens are really Stainton's species; the only point of difference in his description is that he represents the first spot on inner margin as being extended to costa, which may be a slight error or an individual variety, as the description was taken from one specimen only, sent from Brisbane; moreover he gives the size as only 3″, and the fascia in his figure appears to be less broad; however it seems best to adopt his name. I have only once taken the imago; I have bred it sparingly from larvæ found in the dry bush round Sydney and Parramatta. in July and October.

Larva yellowish, tapering posteriorly; feeds in a broad, flat, irregular blotch in upper surface of leaves of *Eucalyptus, sp.*, in September. Pupa in a flat cocoon within the mine. In the case of this and other Eucalyptus-feeding insects it is commonly very difficult or impracticable to discover the specific name of the *Eucalyptus* to which they are attached; the determination of this genus is always difficult, and the larvæ are generally found to occur on young plants which have not yet flowered.

Grac. chalcoptera, *n. sp.*

♀. 4″. Head, thorax, and palpi bright metallic coppery bronze. Antennæ dark fuscous with indistinct paler rings, basal joint bronze. Abdomen very dark purplish-fuscous. Legs coppery-bronze, tarsi bronzy-fuscous, paler towards base of joints, middle tibiæ hardly thickened. Fore-wings bright metallic coppery-bronze, with two small yellowish-white spots; first on inner-margin beyond middle, narrow, curved, parallel-sided, not reaching middle of disc; second on costa before apex, wedge-shaped, outwardly curved, reaching half across wing; cilia dark fuscous, with indistinct blackish lines round apex. Hind-wings dark fuscous, cilia rather paler.

A brilliant insect, somewhat allied to the group of *auroguttella*, Stph. One specimen taken in March with a lamp amongst the reedbeds in the creek at Parramatta.

Grac. ethela, *n. sp.*

♂ ♀. 5⅓″-5¾″. Head yellow on crown, crimson behind, face snow-white with a pale crimson-pink spot on each side. Maxillary palpi white, lower ⅔ externally pale crimson. Labial palpi white, second joint externally crimson, beneath fringed with a few loose hairs. Antennæ much longer than fore-wings, pale greyish-ochreous, basal joint yellow. Thorax yellow, anterior margin broadly crimson, and with a small crimson spot behind. Abdomen pale greyish-ochreous. Legs yellowish-white, tarsi with very slender blackish rings at apex of joints, anterior and middle tibiæ slightly thickened, crimson-fuscous at apex and with two slender dark fuscous rings. Fore-wings pale yellow, deeper along inner margin, with a bright crimson irregular-edged undulating central streak from base to apex, connected with inner margin by four perpendicular half-fasciæ, one close to base, the others at ¼, ½, and ¾, and expanding abruptly at apex into a large apical spot; at the base this streak reaches costa, and at ⅓ from base is again connected with it by a perpendicular spot; beyond this on costa are two small crimson strigulæ; central streak in parts margined above with black; parallel to its upper edge, and immediately above it, is a waved, black, longitudinal line, extending from midway between third and fourth inner-marginal spot to midway between fourth and apical spot; apical spot pure crimson, containing a circular black spot above centre, above which the colour becomes brownish-ochreous and is margined on costa with black; lower half of apical spot filled up with a sharp wedge-shaped snow-white spot, the base of which is yellow and separated from the rest by a crimson line: cilia yellow round apex, containing a blackish hook, crimson below apical spot, thence pale crimson-grey. Hind-wings dull pale purple-crimson, costal cilia grey, rest suffused with pale crimson.

Var. *a.*—all the crimson markings replaced by dull fuscous.

This exceedingly beautiful insect cannot be compared with any other, but is probably most allied to *formosa* and *ida*, The loosely haired second joint of the palpi render it peculiar in the genus, but the hairs do not form a tuft, and it cannot therefore be referred to *Coriscium*, to which it is not otherwise specially related; probably Stainton is correct in stating his opinion that a konwledge of the exotic species of *Gracilaria* will tend to widen the definition of the generic structure in respect of the scaling of the labial palpi, in which allied species deviate. I took seven very perfect specimens (six typical, one of the variety) amidst dense growth in the swampy virgin forest near Hamilton, on the Waikato, New Zealand, in January, mostly under tree-ferns. New Zealand insects are usually rather sombre; and I shall not easily forget the emotion with which, in the depths of the forest shades, I saw this lovely insect, whose ethereally pure hues cause it to be one of the most wonderful manifestations of the beauty of nature.

Grac. formosa, *Stt.*, Trans. Ent. Soc. Lond., Vol. I., 3rd Ser.

♂ ♀. 4½″-5″. Head pale yellow, with a central stripe on crown and the sides crimson; face white with a few crimson scales. Maxillary palpi white, faintly crimson-tinged. Labial palpi white, second joint externally faintly suffused with crimson and with slender dark fuscous apical and subapical rings, terminal joint with slender ring near base. Antennæ longer than fore-wings, pale ochreous-brown, darker towards apex, basal joint yellow in front, crimson above. Thorax crimson, with a white central streak. Abdomen dark fuscous, at base ochreous, beneath white. Legs whitish; anterior tibiæ crimson, apex suffused with dark fuscous, middle tibiæ somewhat thickened, almost tufted at apex, crimson with yellow basal and median bands, all tarsi with dark fuscous rings at apex of joints. Fore-wings crimson, paler and partially suffused with yellow along costa, especially beyond middle, with a basal streak, six costal and four dorsal streaks, and a spot on fold white, partially suffused with yellow; basal streak very short, irregular, dark-margined, its extremity produced through centre of wing to middle as a dark fuscous line; first and second costal streaks irregular, very oblique, white, not margined; third elongate-triangular, very oblique, not margined; fourth irregular black margined; fifth short, less oblique, strongly black margined, the black margins continued to anal; costal space between fourth and fifth yellwish-white; sixth short, black margined, not oblique, black margins produced to hind-margin and diverging; first dorsal spot at base, very small; second small, opposite first costal, obtuse-triangular, white, black edged in front on inner-margin; third before middle, yellow, very broad on inner-margin, very much contracted on fold and proceeding as a very oblique white dark-margined streak to disc; fourth yellow, very broad on inner-margin, extending from middle to anal angle, obtuse-triangular, apex dark-margined; a round white spot on fold between second and third, not touching either; hind-margin suffused with dark fuscous except within the two pairs of dark streaks from costa; apical spot round, black; cilia crimson at apex, yellow on hind-margin, thence dark fuscous, with a crimson subapical hook. Hind-wings and cilia dark grey.

Stainton's description clearly includes both this insect and the succeeding species, which is very closely allied to it; they are however certainly distinct. His figure seems to be taken from a specimen of this species, for which I have accordingly retained the name. The true *formosa* is best known by the narrower fore-wings, yellower markings, which also differ in detail, and especially by the round white spot on the fold, which in *Grac. ida*, forms part of a dorsal streak. A widely distributed species, but almost always taken singly, without any clue to its habits; occurs at Sydney, Parramatta, and Bulli, and also near Brisbane and Melbourne, from October to March without apparent interruption, usually in thick bush.

Grac. ida, *n. sp.*

♂ ♀. 5‴-5¼‴. Head white, very faintly tinged with yellowish, with a broad central stripe on crown and the sides crimson; face white, speckled with crimson. Maxillary palpi white, apex of second and terminal joints dark fuscous. Labial palpi white, base and apex crimson, second joint with subapical and apical rings, terminal joint with a ring near base dark fuscous. Antennæ longer than fore-wings, ochreous-grey, darker towards apex, basal joint crimson, in front white. Thorax whitish, irregularly suffused and spotted with crimson. Abdomen blackish, beneath snow-white. Legs whitish, anterior tibiæ crimson with two slender white rings, middle tibiæ somewhat thickened, almost tufted at apex, with two white bands, all tarsi with slender dark fuscous rings at apex of joints. Fore-wings crimson, disc usually suffused with fuscous-grey, with seven costal and normally five (sometimes partially confluent) dorsal streaks and an apical spot white, faintly tinged with creamy-yellowish; a minute white spot on costa at base; first, second, and third costal streaks irregular, very oblique, not margined, reaching middle of wing; fourth subquadrate, unmargined; fifth immediately adjacent to fourth, fifth and sixth short, subquadrate, each enclosed between dark fuscous margins which are extended very obliquely to beyond middle of wing, ending in loops; costal space between fifth and sixth white; seventh subquadrate, enclosed between dark margins contracted and produced to middle of hind-margin; first dorsal spot small, close to base; second and third long, acute-triangular very oblique, second sometimes confluent with first on margin; fourth before anal angle, obtuse-triangular, not oblique; fifth on hind-margin above anal angle, elongated along margin, sometimes confluent with fourth; a small white spot above middle of wing between second and third costal streaks; a curved white streak immediately before apex, enclosing a round black apical spot; cilia yellowish round apex, with two crimson hooks, thence dark fuscous-grey. Hind-wings and cilia dark fuscous-grey.

Somewhat less brightly coloured than *formosa*, but even more elegant. At first sight the two species are very similar, and both are somewhat variable, but within constant limits; for the identification of this species I should lay stress upon the broader wings, the frequent (but not invariable) suffusion with fuscous-grey, the irregular crimson spotting of the thorax, the head white rather than yellow, and the detailed differences in marking, especially the presence of several additional small spots, the absorption of the spot on the fold by the second dorsal streak, and the termination of the dark costal streaks not on hind-margin but in loops before reaching it. The species is also widely distributed, and has the same habits as the last; taken at Sydney, Parramatta, Bulli, and Brisbane, from August to November, in January, and March.

Grac. mnesicala, *n. sp.*

♂. 3¾″. Head and palpi snow-white, terminal joint of labial palpi with slender black basal, central, and apical rings. Antennæ as long as fore-wings, white, annulated with dark fuscous. Thorax white, posteriorly brownish-ochreous. Abdomen pale greyish-ochreous. Legs white, tarsal joints very slenderly black at apex, anterior and middle tibiæ ringed with black, not thickened. Fore-wings snow-white, inner margin within an irregular line from centre of base to anal angle brownish-ochreous, intersected by two very oblique white lines before and beyond middle; eight dark fuscous oblique, transverse strigulæ from costa between base and ¾, nearly reaching inner-marginal streak, the first four interrupted and broken into spots, the seventh connected on disc with a longitudinal strigula from centre of wing; between the eighth and apex are two other similar, less oblique strigulæ from costa reaching across wing, the interior one connected with the eighth by three longitudinal streaks; a small cloudy subapical fuscous spot, and a black apical dot; cilia white round apex, with a greyish-ochreous spot at apex, and with two faint fuscous lines, thence whitish-grey. Hind-wings fuscous-grey, cilia whitish-grey.

Allied to the preceding and following species, but at once distinguished from all by the ochreous inner-marginal streak. Two specimens taken in dry scrub near Sydney and Parramatta, in September.

Grac. lyginella, *n. sp.*

♀. 3″. Head and palpi snow-white, terminal joint of labial palpi with a black subapical ring. Antennæ as long as fore-wings, white, annulated with black. Thorax white (?). Abdomen greyish-ochreous, anal segment black at base. Legs white, tarsal joints very broadly black at base, tibiæ irregularly banded with black, not thickened. Fore-wings white, with blackish-fuscous markings, tending to become suffused towards apex; a central streak from base to middle of wing; an inwardly oblique costal strigula near base; two costal spots before and after ¼, the first larger; between the second and the basal streak is a short longitudinal streak; beyond these are three irregular oblique strigulæ from costa becoming confluent on disc and extending confusedly to inner-margin; on inner-margin is a small spot near base, and two oblique strigulæ before middle, uniting with basal streak; a cloudy costal spot before apex; an elongated black apical streak; cilia round apex white with two black lines, thence fuscous-grey. Hind-wings fuscous-grey, cilia rather paler.

Distinguished by its small size and cloudy markings, which also differ in detail. One specimen only, from dry bush at Parramatta in October.

Grac. aëllomacha, *n. sp.*

♂. 3½‴. Head and palpi snow-white, labial palpi with apex of second joint and a subapical ring of terminal joint black. Antennæ longer than fore-wings, white. Thorax snow-white, with a small black shoulder spot. Abdomen dark fuscous, beneath with white rings and white towards apex. Legs white, tarsi with three black rings, anterior tibiæ black, middle tibiæ hardly thickened, apical half black. Fore-wings white, with coarsely scaled fuscous-black markings; a cloudy, central, longitudinal streak from near base to disc above anal angle, connecting obscurely with seven oblique costal and five oblique dorsal streaks; costa blackish at base; first and second costal streaks thick, hardly oblique, meeting first and second dorsal streaks; third slender, very short, not reaching central streak; fourth strong, from middle of costa; fifth slender, short; sixth thick, black, very oblique, uniting with the small fifth dorsal on anal angle; fourth dorsal thick, before middle; seventh costal slender, produced nearly to hind-margin; apical spot black, large, round, cloudy; cilia white round apex, dark fuscous at anal angle, with two black lines and a short black apical hook, thence fuscous-grey. Hind-wings fuscous-grey, cilia paler.

Not particularly close to the preceding; it resembles rather the figure of Zellers's *urbanella*, from South America, which however he considers to be hardly a true *Gracilaria*. One specimen from forest growth at Wellington, New Zealand, in January.

Grac. thalassias, *n. sp.*

♂ ♀. 2¾‴-3½‴. Head and maxillary palpi white. Labial palpi white, second joint loosely scaled beneath, with apex blackish, terminal joint with slender blackish median and subapical rings.

Antennæ not longer than fore-wings, white, annulated with dark fuscous. Thorax white, lateral margins ochreous. Abdomen pale greyish-ochreous, beneath white. Legs white, anterior and middle tibiæ hardly thickened, blackish with three white rings, all tarsi with blackish rings at apex of joints. Fore-wings varying from pale clear ochreous to greyish-ochreous, with a basal streak, five costal and three dorsal streaks white; basal streak rather short, rather slender, not margined, sometimes connected at its middle with costa; first costal streak at ⅓, second at ½, both long, slender, oblique, dark-margined; third rather less oblique, dark-margined, more or less perfectly uniting with third dorsal streak from anal angle; fourth costal from before apex to middle of hind-margin, continued into cilia, dark-margined; first dorsal slightly beyond first costal, rather long, very oblique, dark-margined above, produced along inner-margin as a white unmargined streak to base; second dorsal rather thick, irregular, its apex swollen, dark-margined, very oblique; a small white apical spot, continued above into cilia, enclosing the small linear-ovate black apical dot; cilia greyish-ochreous round apex, extremities white, beneath apex whitish. Hind-wings and cilia whitish-grey.

This species belongs to the group of *pavoniella*, Z., but is readily known by its pale ground colour, which gives it much the appearance of some species of *Lithocolletis*. Where its foodplant grows, the imago may be taken in great profusion, flying out in swarms when the bush is shaken; it occurs principally on coast sand-hills, at Sydney and Newcastle, New South Wales, from September to January, and in May.

Larva slightly tapering posteriorly, very pale whitish-green, yellowish-tinged on back; head very pale whitish-brown. It mines the leaves of *Leptospermum lævigatum (Myrtaceæ)*, forming a blotch which occupies the whole of the small leaf, both surfaces being much inflated, in January (and no doubt at other times). Pupa outside the mine, in a firm white cocoon beneath a folded corner of leaf. I have also found the larva on *Agonis flexuosa*, a closely allied plant, but a native of West Australia, and only found here under cultivation; it does not however frequent the other common species of *Leptospermum*.

Grac. eumetalla, *n. sp.*

♂ ♀. 3″-3½″. Head, palpi, and thorax bright metallic bronzy-green, face bright silvery. Antennæ as long as fore-wings, blackish. Abdomen black above, silvery-white beneath. Legs metallic silvery, posterior tibiæ stiff-haired above, and, together with tarsi, suffused externally with fuscous. Fore-wings bright metallic coppery or bronzy green, with white violet-shining markings, consisting of four costal and four dorsal short slender wedgeshaped streaks, and a discal spot, all black-margined; first costal streak at ⅓, second at ½, both slightly oblique outwardly; third at ¾, short, not oblique; fourth uniting with fourth dorsal streak to make an inwardly curved fascia; first dorsal streak much before first costal, rather long, curved, very oblique; second short, straight, between first and second costal streaks; third opposite third costal, outwardly oblique, nearly uniting with fourth; a small irregular, sometimes double, discal spot between second and third pairs of streaks; apical spot round, black, obscure; cilia blackish-fuscous, with a black line round apex. Hind-wings and cilia blackish-grey.

A brilliant insect, distinguished amongst its allies by its bright metallic colouring. I beat several specimens from a phyllodineous *Acacia* (to which it is probably attached) near Brisbane in September; also once taken on a fence near Sydney, in October.

Grac. eupetala, *n. sp.*

♂ ♀. 3¼″-3½″. Head and palpi bright metallic grey-silvery. Antennæ as long as fore-wings, blackish. Thorax deep metallic bronze. Abdomen blackish, beneath snow-white with black bands. Legs dark fuscous, tarsal joints with slender whitish apical rings. Fore-wings pale golden-ochreous on disc, elsewhere especially on inner-margin, suffused with dark metallic bronze, with pearly-white obscurely dark-margined markings, consisting of four costal and four dorsal streaks or spots, and a small discal spot; first three costal streaks before and beyond middle and at ¾, slender, short, oblique, with violet reflections; fourth closely after third not oblique; first dorsal spot conspicuous, broadly wedgeshaped, oblique and curved outwards; second rather smaller, triangular, not oblique, between first and second costal; third still smaller, triangular, opposite third costal; fourth minute, indistinct, opposite fourth costal; discal spot small, circular, between second and third pairs of streaks; apical space suffused with blackish; cilia white round apex, with a black line, thence fuscous-grey. Hind-wings and cilia fuscous-grey.

Nearly allied to the preceding, but much less brilliant, and the first three dorsal spots are much broader and more conspicuous. Not common; in *Acacia* groves near Parramatta, and on fences in Sydney. I once bred the species, almost certainly from a branch of *Acacia decurrens, (Leguminosæ)*, which was in my room; but the larva had not been noticed.

NOTE.—I have found a *Gracilaria* larva mining flat whitish blotches in the phyllodia of *Acacia longifolia*, which I have not yet succeeded in breeding; it is probably an allied species.

Grac. alysidota, *n. sp.*

♂ ♀. 3‴-4½‴. Head white, with a dark fuscous stripe on sides. Palpi whitish, maxillary palpi very short. Antennæ not longer than fore-wings, dark fuscous, apical third white. Thorax dark fuscous, with a white spot in front. Abdomen dark fuscous, beneath white. Legs greyish-fuscous, apex of tarsal joints indistinctly whitish, posterior tibiæ stiff-haired near apex. Fore-wings dark fuscous, towards apex sometimes suffused with ochreous, with five costal and four dorsal streaks, and a streak along inner-margin white, blackish-margined; first costal streak at ¼, rather long, very oblique, slightly produced along costa towards base; second at ½, longer, very oblique; third before ¾, rather shorter, equally oblique; fourth short, not oblique, uniting with fourth dorsal to form a straight slender fascia; first dorsal immediately before middle, short, oblique, connected with a streak along inner-margin to base; second beyond middle, small, semiovate; third opposite third costal, rather short, oblique; fifth costal apical, intersecting the round black apical spot; cilia whitish round apex, with two black lines, thence dark fuscous-grey. Hind-wings and cilia fuscous-grey.

Not very near to any described species; easily recognised by the white streak on basal half of inner-margin on a dark fuscous ground. Three specimens, taken in mixed bush near Sydney, and on the Bulli Pass, in October and March.

Grac. ochrocephala, *n. sp.*

♂ ♀. 4″. Head whitish-ochreous above, face whitish. Maxillary and labial palpi wholly white. Antennæ longer than forewings, dark fuscous, with faint paler annulations. Thorax whitish ochreous, lateral margins ochreous-fuscous. Abdomen dark fuscous, beneath narrowly white, anus white. Legs dark fuscous posterior tibiæ and apical rings of all tarsal joints ochreous-whitish, posterior tibiæ stiff-haired. Forewings deep brownish-ochreous, with a broad stripe along inner-margin from base, terminating abruptly at anal angle, whitish, entirely suffused with ochreous except along its upper edge, black margined above; a clear white, black margined, slender, oblique streak from costa at ¾, extending to hind-margin, its upper extremity produced along costa as a very slender white unmargined streak to ¼ from base; a second similar parallel streak immediately before apex; cilia dark fuscous, containing two snow-white posteriorly black-edged strigulæ above apex, and an ochreous-whitish mark beyond anal angle. Hind-wings blackish-fuscous, cilia slightly paler.

This and the three following species are very closely allied together; they belong to the group of *scalariella*, Z. and *gemoniella* Stt. They are best distinguished from one another by the different groundcolours, and the colouring of the inner-marginal streak and of the head; *ochrocephala* is also to be known by the slender white streak along costal edge. Two specimens, from mixed growth at Sydney and on the Bulli Pass, in October and November.

Grac. nereïs, *n. sp.*

♂. 4‴. Head and thorax glossy-white tinged with brassy-yellow, lateral margins of thorax blackish. Maxillary palpi white, exteriorly dark fuscous. Labial palpi white, second joint exteriorly dark fuscous, terminal joint with some scattered fuscous scales. Antennæ longer than fore-wings, dark fuscous. Abdomen blackish above, wholly snow-white beneath. Legs white, tarsal joints with broad dark fuscous rings at base, anterior tibiæ dark fuscous, middle tibiæ hardly thickened, dark fuscous with white median band, posterior tibiæ stiff-haired. Fore-wings dark fuscous, with a rather broad brassy yellowish-white stripe along inner-margin from base terminating abruptedly at anal angle, very strongly black margined above; a white circular spot on hind-margin just above anal angle; a thick black oblique streak from costa at four-fifths, extending to the white hind-marginal spot; a similar streak just before apex, ending in apex; cilia dark fuscous-grey, with two white posteriorly black margined strigulæ above apex, and a black apical hook. Hind-wings blackish-fuscous, cilia slightly paler.

Nearest to *didymella;* distinguished by the darker ground colour, brassy-metallic tints, and the obscuration of the white costal streaks with black scales. One specimen on a fence in Sydney, in November.

Grac. didymella, *n. sp.*

♂. 4½″. Head and palpi pure white, labial palpi with extre apex of second joint blackish. Antennæ longer than fore-win dark fuscous, beneath whitish ; basal joint black, longitudina striated with white. Thorax white, lateral margins dark fusco Abdomen dark fuscous, beneath whitish, anal tuft white. L whitish, suffused above with dark fuscous, except posterior til and apex of tarsal joints; posterior tibiæ stiff-haired abo Fore-wings dark greyish-ochreous, with a broad white, abc black margined, stripe along inner-margin from base, abrup rounded off at anal angle ; extreme inner-marginal edge fain ochreous; immediately beyond end of dorsal stripe a wh elongate spot along hind-margin; a white strongly black margin slender, oblique streak from costa at ¾, reaching hind-margi spot; another similar parallel streak immediately before ap terminating in the small round, black, apical spot; cilia fusco grey, with two white posteriorly black margined strigulæ abo apex, inner one very marked. Hind-wings fuscous-grey, ci paler.

Differs from both the preceding by the white head and alm wholly white dorsal streak; from *ochrocephala* also by the wh hind-marginal spot, and from *nereïs* by the white costal strea One specimen in a garden near Sydney in September.

Grac. laciniella, *n. sp.*

♂ ♀. 3¼″-3¾″. Head and palpi white, second joint of lab palpi dark fuscous at apex, apical scales somewhat produc beneath, terminal joint with a fuscous ring near base. Anten as long as fore-wings, white at base, becoming gradually da fuscous. Thorax white, lateral margins dark greyish-ochreo Abdomen ochreous-grey, beneath pure white. Legs whi anterior and middle tibiæ hardly thickened, dark fuscous w white rings near base and in middle, posterior tibiæ stiff-hair all tarsi with apical bands of joints and two rings on basal joi dark fuscous. Fore-wings ochreous-fuscous, with a clear white streak along fold from base to just above anal angle, not touching inner-margin, margined with black above and below at extremity only; a white elongate spot on hind-margin; an oblique slender white black margined streak from costa at four-fifths, meeting the white hind-marginal spot; a second similar streak just before apex; both these streaks are often quite obsolete; apical spot irregular, black; cilia fuscous-grey, with two white posteriorly black margined strigulæ above apex. Hind-wings and cilia fuscous-grey.

Distinguished from its allies by its smaller size, and by the white streak being clearly removed from inner-margin. It also has the peculiar habit of holding its antennæ porrected forwards, and somewhat divergent, when at rest. A common species, occurring among dry scrub near Sydney and Parramatta, at Bulli, and at Blackheath on the Blue Mountains (3,500 feet); also at Brisbane. It is generally beaten from *Eucalyptus*, and I have found a larva mining flat whitish blotches in the leaves of *Eucalyptus*, which I expected to produce it, but have not yet succeeded in rearing.

Grac. albomarginata, *Stt.*, Trans. Ent. Soc. Lond., Vol. I., 3rd Ser.

"4½″. Head white, with a few grey scales. Maxillary palpi white, very minute. Labial palpi white, with a dark grey ring before apex of second joint, and base and apex of terminal joint greyish. Antennæ white, with grey annulations. Anterior tibiæ dark grey, tarsi white, with two broad dark grey blotches; middle tibiæ dark grey with white blotches, tarsi white; posterior tibiæ whitish, tarsi white spotted with dark grey; all the legs appear usually hairy. Fore-wings dark brownish-grey, with a narrow, white stripe all along inner-margin, and the costa narrowly white from middle to near apex; margins of these streaks not sharply defined, that on the inner-margin especially is very jagged; a minute black apical spot, with a metallic-bluish tinge; hind-margin expressed in black scales; cilia grey, intersected by a row of blackish scales round the hind-margin, and with a tendency to a small projecting blackish hook."

The above is Stainton's description, taken from a single specimen with thorax injured, and no abdomen, from near Brisbane; it does not appear to correspond to any insect I have seen, but the species is probably allied to the group of *laciniella.*

CORISCIUM, Z.

Head smooth; no ocelli; tongue long. Antennæ as long or longer than fore-wings, slender, filiform. Maxilllary palpi rather long, filiform. Labial palpi moderately long, slender, ascending, second joint beneath with projecting tuft of hairs; terminal joint longer than second, pointed. Fore-wings elongate, very narrow, parallel-sided. Hind-wings very narrowly-lanceolate, much narrower than fore-wings, cilia thrice or four times as broad. Abdomen elongate, slender. Legs long. Fore-wings with 12 or 11 veins, 5 branches to costa, no secondary cell, 1 simple. Hind-wings with 8 veins; 5 and 6 stalked, cell open.

A small genus, comprising only some eight or nine species as yet, but found in every part of the globe; it only differs from *Gracilaria* by the distinct rather long tuft of hairs on the second joint of the palpi. In repose they usually have the same attitude as in *Gracilaria;* the larval habits are also similar.

Cor. ochridorsellum, *n. sp.*

♂ ♀. 4½‴-5‴. Head pure ochreous, face white. Maxillary palpi whitish, basal joint fuscous. Labial palpi whitish, second joint externally dark fuscous, with a blackish tuft nearly as long as terminal joint, its anterior edge white; terminal joint with an indistinct fuscous ring near base. Antennæ much longer than fore-wings, dark fuscous with slender whitish annulations, basal joint whitish. Thorax ochreous-whitish, with a dark fuscous spot on shoulder. Abdomen pale greyish-ochreous, with a row of oblique linear dark fuscous spots on sides. Legs slender, dark fuscous, all tarsi with whitish rings at apex of joints, posterior tibiæ stiff-haired. Fore-wings blackish with a few ochreous scales, with inner-margin rather broadly whitish-ochreous from base almost to apex, dilating and becoming deeper ochreous above anal angle; three small white costal spots; first beyond middle, very small; second and third near together before apex, slender, oblique, meeting the dorsal streak; extreme apex jet black; cilia whitish round apex, with two black lines, thence dark fuscous-grey. Hind-wings and cilia dark fuscous-grey.

Easily known by the broadly ochreous inner-margin. This species walks with the forepart raised and the legs moderately displayed, as usual in the genus; but in repose on tree-trunks, as it is generally found, the body is closely appressed to the bark, and the anterior and middle pairs of legs stretched out laterally and also closely appressed to the surface, a modification adopted for the sake of concealment. The imago is common on the trunk of its food-plant in gardens in Sydney, from November to February.

Larva attenuated posteriorly, deep green; head extremely small, black; it mines an irregular flat, rather small blotch, on upper side of leaves of *Phyllanthus Ferdinandi*, (*Euphorbiaceæ*), in January and February. Pupa inside the mine, in a slight cocoon; this is certainly the normal habit.

Cor. æolellum, *n. sp.*

♂. 4½‴. Head white, on crown tinged with ochreous and mixed with grey. Maxillary palpi whitish. Labial palpi white, second joint externally dark fuscous, with a blackish tuft nearly as long as terminal joint; terminal joint with two black rings. Antennæ longer than fore-wings, dark fuscous with paler annulations, extreme apex white. Thorax ochreous-grey mixed with dark fuscous. Abdomen greyish-ochreous. Legs dark

fuscous, tarsi with white rings at apex of joints. Fore-w
whitish, irrorated with dark grey-fuscous scales, especially tow
costa and apex, leaving an ill-defined whitish space along
from base to middle of wing, and with obscure black marki
a short central streak from base ; two large irregular discal
before and after middle ; some cloudy blackish spots ben
costa ; a very oblique thick streak from ⅔ of costa nearly to
margin, above which is a similar shorter streak, not reac
costa ; a black curved transverse line across wing just before a
followed by a white line ; apical spot round, upper half w
lower black ; cilia whitish round apex, with two black l
thence fuscous-grey. Hind-wings and cilia fuscous-grey.

An obscurely marked species, of which the only specim
not very perfect, but certainly distinct from the preceding.
specimen taken on Mount Keira, near Wollongong, in Octo

EPICEPHALA, *n. g.*

Head roughly short-haired on crown, hairs longer and dir
forwards between antennæ, face smooth; no ocelli; to
moderate. Antennæ longer than fore-wings, slender, filif
basal joint compressed. Maxillary palpi rather-long, filif
Labial palpi moderate, somewhat drooping, cylindrical, se
joint with appressed scales. Fore-wings elongate, nar
tolerably evenly pointed. Hind-wings narrow-lanceolate,
as broad. Abdomen elongate, in ♂ tufted, in ♀ with exs
ovipositor. Legs moderate, slender. Fore-wings with 10 ve
4 branches to costa, no secondary cell, 1 simple. Hind-w
with 7 veins ; 4 and 5 stalked, cell open.

In general structure near *Ornix*, Z., though the head is
quite so rough ; differs in the venation, and also in the pec
posture assumed in repose ; the imago rests with the h
appressed to the surface, the hind-part raised considerably
seemingly to be supported on the posterior legs, the anterior

middle pair extended laterally and appressed to the surface. The wings are relatively broader than in *Gracilaria*.

Epic. colymbetella, *n. sp.*

♂ ♀. 4½‴-5‴. Head white, with a few black hairs above antennæ. All palpi white, externally mixed with fuscous. Antennæ white, annulated with dark fuscous. Thorax fuscous-grey, speckled with whitish. Abdomen greyish-ochreous. Legs whitish, anterior and middle tibiæ fuscous-grey, tarsal joints fuscous-grey at base. Fore-wings whitish, densely irrorated with dark fuscous-grey scales, the absence of which causes white markings, more or less strongly margined with dark fuscous-grey; three rather short oblique costal streaks, the first longest; a fourth immediately after third, a little before apex, not oblique, almost or quite meeting a similar dorsal streak beyond anal angle; three other longer and more oblique dorsal streaks, but these are almost always confused and confluent into an irregular streak along inner margin; a bright ochreous round apical spot, containing a smaller black spot; cilia round apex white, with two strong black lines, thence dark fuscous-grey. Hind-wings and cilia dark fuscous-grey.

Common on garden fences in Sydney, from November to January.

BEDELLIDÆ.

BEDELLIA, *Stt.*

Head rough above, almost tufted, face smooth; tongue short. Antennæ as long as fore-wings, filiform; basal joint thickened. No maxillary palpi. Labial palpi very short, somewhat porrected, filiform. Fore-wings elongate, narrow, long-pointed. Hind-wings linear-lanceolate, ½ of fore-wings, cilia six times as broad. Abdomen moderate. Legs slender, posterior tibiæ compressed, hairy. Fore-wings with 8 veins; 3 and 4 stalked, 4 branches to costa, cell closed, 1 simple. Hind-wings without cell; median three-branched, 1 branch to costa.

There appears to be but one species known in this genus, occurring throughout Europe and in North America, as well as Australia. The imago rests with the fore-part somewhat raised, but the fore-legs retracted beneath the body. The larva is sixteen-legged, and mines flat blotches in leaves. The pupa is naked and angulated, suspended from a leaf.

Bed. somnulentella, *Z.*

♂ ♀. 3½‴-4‴. Head and palpi whitish-ochreous mixed with fuscous. Antennæ dark fuscous. Thorax whitish-ochreous, in front brownish-grey. Abdomen fuscous-grey, anal tuft ochreous. Legs whitish-ochreous. Fore-wings pale dull-ochreous, suffused and irrorated with brownish-grey, except on a streak along inner-margin; costal cilia sharply ochreous-whitish, the rest grey, irrorated with darker at apex. Hind-wings and cilia grey.

The description is from Australian specimens, which do not appear to differ specifically from the English. I have not however observed the larva in this country as yet; elsewhere it mines the leaves of *Convolvulus* and *Ipomœa*. It hardly seems a very likely species to have been introduced artificially, but it does not now seem easy to decide; it is not confined to the near neighbourhood of civilisation, and there are many native species of *Ipomœa*. Taken commonly in particular localities at Sydney and Parramatta and amongst the dense forest growth on the descent of the Bulli Pass, where it is especially abundant.

ARCTOCOMA, *n. g.*

Head roughly haired above, face smooth; no ocelli; tongue short. Antennæ rather shorter than fore-wings, filiform, basal joint somewhat thickened. No maxillary palpi. Labial palpi very short, drooping. Fore-wings elongate-lanceolate, rather broad comparatively. Hind-wings lanceolate, ½ of fore-wings, cilia thrice as broad. Abdomen moderate, stout. Legs rather short, posterior tibiæ compressed, very hairy. Fore-wings with 6 veins; 1 and 2 simple; 3, 4, 5 to costa, forming branches of subcostal vein; no cell. Hind-wings without cell; median simple; submedian very obsoletely twice-branched.

Allied to the preceding genus, but distinguished by the much broader wings, the antennæ shorter than fore-wings, and the low type of neuration. The imago in repose sits closely appressed to surface.

Arct. ursinella, *n. sp.*

♂ ♀. 3¾″-4″. Head, palpi, thorax, and abdomen deep ochreous brown. Antennæ dark fuscous. Legs brownish-grey. Fore-wings unicolorous rather deep ochreous-brown; cilia fuscous-grey. Hind-wings and cilia dark fuscous-grey.

Beaten commonly from *Acacia decurrens*, at Parramatta, and also at Bulli, in October.

LYONETIDÆ.

STEGOMMATA, *n. g.*

Head roughly tufted on crown, face smooth; no ocelli; tongue moderate. Antennæ as long or longer than fore-wings, slender, filiform, basal join dilated into a moderate eyecap, fringed in front. Maxillary palpi obsolete. Labial palpi moderately short, straight, rather drooping, smoothly scaled. Fore-wing elongate, narrow, pointed, apex caudate. Hind-wings linear-lanceolate, cilia five times as broad. Abdomen elongate. Legs moderate, slender. Fore-wings with 8 veins, cell closed, 1 strongly furcate at base, 5, 6, 7 to costa. Hind-wings without cell; median twice-branched; submedian apparently simple.

This genus is nearly allied to *Lyonetia*, Hb., and the neuration is essentially identical; it differs in the strongly-tufted, rough

head. The species have some superficial resemblance to *Grac*
but rest closely appressed to the surface.

Steg. leptomitella, *n. sp.*

♂ ♀. 3½"-4". Head, palpi, and thorax white, crown
few fuscous-grey hairs. Antennæ white, annulated with
fuscous. Abdomen grey-whitish. Legs white; anterior
apex of middle and posterior tibiæ and of all tarsal joints
fuscous-grey. Fore-wings white with dark fuscous-grey mar
two obscure longitudinal parallel streaks above middle of
from near base to beyond middle, sometimes obliterated;
very oblique streaks from costa, variable in thickness and int
meeting the longitudinal streaks when distinct; beneath th
longitudinal streaks are four longitudinal short black stre
disc, nearly in a line, third longest, in middle of wing,
rather oblique upwardly; five oblique dorsal streaks, but
are generally partially obliterated or interrupted; an irr
black spot in cilia, preceded by two pairs of outwardly rad
fuscous streaks, and followed by two dark fuscous lines
apex; hind-marginal cilia grey-whitish. Hind-wings gre
whitish-grey.

Tolerably common on some fences in Sydney, in Decemb
January.

Steg. sulfuratella, *n. sp.*

♂ ♀. 4"-4¾". Head, palpi, antennæ, and thorax white,
tinged with pale sulphur. Abdomen and legs white.
wings white, dorsal half delicately suffused with pale su
yellow; a very faint pale ochreous, longitudinal line in ce
wing from near base to beyond middle; three costal an
dorsal very faint ochreous oblique streaks; costal streaks b
⅔ and apex, first dorsal streak in middle, second at anal
dorsal margin faintly ochreous for a short distance befor
angle; a clear round black apical dot, preceded by two p

fuscous-grey outwardly radiating streaks in cilia, and an additional streak in hind-marginal cilia, and emitting a fuscous-grey apical hook; cilia white. Hind-wings pale fuscous-grey, cilia white.

Not capable of being confused with the last species. Common on fences in Sydney, in January and from April to August.

PHYLLOCNISTIS, Z.

Head smooth; no ocelli; tongue short. Antennæ shorter than fore-wings, slender, filiform, with a rather small eyecap. No maxillary palpi. Labial palpi short, drooping, very slender, filiform. Fore-wings elongate, narrow, pointed, apex rather produced. Hind-wings very narrowly lanceolate, ⅓ of fore-wings, cilia five times as broad. Fore-wings with 9 veins; 4 and 5 stalked; 4 branches to costa, cell closed, 1 simple. Hind-wings without cell; median twice-branched.

The genus contains only a few closely allied species, but is found also in Europe, North and South America, and India. The larvæ are apodal, mining blotches in leaves. The pupa is in a cocoon inside the mine.

Phyll. diaugella, *n. sp.*

♂ ♀. 1¾"-2¾". Head, palpi, antennæ, thorax, abdomen, and legs shining silvery-white. Fore-wings pearly white, with two longitudinal fuscous streaks from base of costa to middle of disc, not united posteriorly; an outwardly oblique, rather curved fuscous streak from costa beyond middle, nearly meeting a straight perpendicular fuscous transverse fascia immediately beyond it, the lower extremity of which sometimes forms a spot on inner-margin; between the fascia and apex is a rather large oval golden-ochreous patch; apical spot very distinct, round, black, preceded by two divergent fuscous streaks in costal cilia, and two others less distinct and equally divergent in hind-marginal cilia, and emitting a short grey apical streak; cilia white. Hind-wings whitish, cilia white.

Easily known from the following species by the longitudinal lines, and the absence of the costal blotch. Some specimens are extremely small, apparently the later brood. Taken occasionally at Manly, near Sydney, where the larva is common; in December March, and May.

Larva apodal, somewhat tapering posteriorly, pale yellowish; mines a flat irregular blotch, apparently consisting of a spiral gallery, in leaves of *Euphorbia sparmanni*, (*Euphorbiaceæ*), in February (and doubtless at other times).

Phyll. iodocella, *n. sp.*

♂. 2¼″. Head, palpi, thorax, abdomen, and legs shining silvery-white. Antennæ white, towards apex infuscated. Fore-wings yellowish-white, with a semi-ovate dark fuscous, oblique blotch on costa near base, reaching to middle of wing; three costal and one dorsal, slender, oblique dark fuscous streaks; first costal in middle, second very short, third longest, continued to hind-margin; the dorsal streak beyond middle, bordered posteriorly by a small greyish-fuscous spot; dorsal margin slenderly blackish about anal angle; apical spot round, black, with apparently three radiating fuscous streaks in cilia above it, and one below it; cilia white. Hind-wings and cilia white.

Conspicuous by the costal blotch near base. One specimen on a fence in Sydney in November.

Opostega, Z.

Head smooth behind, roughly short-haired on face and fore-head; no ocelli; no tongue. Antennæ shorter than fore-wings, thick, filiform, with a large eyecap. Maxillary palpi distinct. Labial palpi short, drooping, terminal joint very short. Fore-wings elongate, narrow, pointed. Hind-wings very narrowly lanceolate, cilia long. Abdomen flattened. Legs moderate posterior tibiæ and first joint of tarsi stiff-haired. Fore-wings with four simple attenuated longitudinal veins. Hind-wings without cell; median three-branched.

Also a small genus, of which the larvæ are all practically unknown, occurring in Europe and North America.

Op. orestias, *n. sp.*

♀, 3″. Head, palpi, antennæ, thorax, abdomen, and legs snow-white. Fore-wings snow-white, with a small, bright ochreous-yellow apical blotch; an oblique dark fuscous streak from costa at ⅔, bent posteriorly, ending in apex; a small clear black apical dot in cilia; three rather indistinct radiating fuscous streaks above it in costal cilia, the middle one darkest; cilia white. Hind-wings very pale whitish-grey, cilia white.

Distinguished by the yellow apex, and single costal streak. One specimen near Brisbane in swampy bush, in September.

Op. stiriella, *n. sp.*

♂ ♀. 2½″-3″. Head, palpi, thorax, abdomen, and legs snow-white. Antennæ ochreous with white rings, basal joint white. Fore-wings snow-white; costal edge slenderly blackish at base; a small wedge-shaped oblique dark fuscous spot on costa, and a similar rather smaller one before middle of inner-margin, neither extending across more than ¼ of breadth of wing; an oblique ochreous-fuscous streak from ¾ of costa, ending suffusedly in apex; a minute black apical spot, with an inwardly oblique fuscous streak above it in costal cilia, and sometimes a second less oblique and very obscure, and one below it in hind-marginal cilia; cilia white. Hind-wings and cilia white.

Nearly allied to the following species, but may be known by the white hind-wings, and the oblique spots never form a complete fascia. Tolerably common at Parramatta, and in parts of the dense forest-growth on the slope of the Bulli Pass, in September and October, and again in March.

Op. gephyræa, *n. sp.*

♂ ♀. 3″-3¾″. Head, palpi, thorax, and legs snow-white, tars slightly infuscated. Antennæ ochreous-fuscous, very slenderl annulated with white, basal joint white. Abdomen fuscous-grey Fore-wings snow-white, extreme edge very slenderly blackish a rather broad oblique blackish-fuscous spot on middle of costa, and a strong oblique fascia-form blackish-fuscous spot from befor middle of inner-margin, uniting to form an angulated fascia, rarely not quite meeting; a very oblique black streak from ¾ o costa to apex, anteriorly broadly edged with fuscous; a secon similar one immediately following it, partly in costal cilia, rathe less oblique; a small black apical spot; cilia whitish round apex, tips suffused with fuscous, sometimes with a faint perpendicula streak above apical spot, hind-marginal cilia fuscous-grey. Hind-wings and cilia fuscous-grey.

Readily distinguished from the preceding by the dark hind-wings and usually perfect fascia. Apparently rather scarce taken on fences in Sydney in October.

ATALOPSYCHA, *n. g.*

Head smooth, with appressed scales; no ocelli; tongue very short. Antennæ shorter than fore-wings, filiform, with a small eyecap. No maxillary palpi. Labial palpi short, drooping, filiform. Fore-wings elongate, narrow, pointed. Hind-wing narrowly lanceolate, less than ½ of fore-wings, cilia thrice a broad. Abdomen moderate. Legs slender, posterior tibiæ long-haired. Neuration (?).

The single species has an extraordinary superficial resemblanc to *Bucculatrix*, and might easily be confused with some of th paler species, yet structurally it is very distinct, since the labial palpi are plainly visible, and the head is not rough. Generally it is more difficult to distinguished from *Phyllocnistis*, especially as I have not been able to examine the venation, although i certainly does not belong to the immediate neighbourhood o that genus; the best points to depend on seem to be the proportionally broader hind-wings, the somewhat loose, not glossy, scaling of the head, and the apex of fore-wings not produced.

Atal. atyphella, *n. sp.*

♀. 3¾″. Head, palpi, and thorax white. Antennæ fuscous with whitish annulations, basal joint white. Abdomen greyish-ochreous. Legs whitish-ochreous. Fore-wings white, with pale ochreous markings irrorated with black scales; a small ovate-linear spot beneath costa slightly before middle; a very oblique streak from middle of costa, posteriorly suffused into an attenuated cloud along costa nearly to apex; a very oblique streak from dorsal margin just beyond middle, almost interrupted on margin itself; apex faintly suffused with ochreous, with indications of a linear apical spot of black scales; cilia very pale whitish-ochreous with a row of black points round apex. Hind-wings pale grey, cilia whitish-grey.

One specimen on a fence near Sydney in October.

CROBYLOPHORA, *n. g.*

Head roughly tufted on crown, face smooth; no ocelli; tongue very short. Antennæ shorter than fore-wings, filiform, with moderate eyecap. No maxillary palpi. Labial palpi short, drooping, filiform. Fore-wings elongate, narrow, pointed, apex hardly produced. Hind-wings very narrowly lanceolate, ⅓ of fore-wings, cilia four or five times as broad. Abdomen moderate. Legs slender, posterior tibiæ stiff-haired. Fore-wings with seven veins; cell closed, 1 simple, 5 and 6 to costa. Hind-wings without cell; median obsoletely two-branched.

This genus is intermediate between *Stegommata* and *Bucculatrix*, resembling both in the roughly tufted head, and also having considerable affinity with them in other respects; it differs from the former by the short antennæ, and from the latter by the presence of labial palpi. The species described are very elegant with a peculiarly thickened metallic spot at the anal angle of the fore-wings; they are slow in flight, and generally appear sluggish.

Crob. daricella, *n. sp.*

♂. 3¼″. Head, palpi, antennæ, thorax, abdomen and legs snow-white; all tarsi with three blackish rings. Fore-wings snow-white, with two slender short oblique black costal streaks, first in middle, second immediately beyond it, closely strewn about which are a few irregular blackish and ochreous scales; a rather large circular thickened silvery metallic spot on anal angle, partially black-edged; cilia white, with a faint fuscous spot in costal cilia, from which proceeds a clear black line round apex, terminating abruptly just beyond it. Hind-wings and cilia white.

Differs from the following species by the larger size, and the absence of the basal and dorsal streaks. Two specimens taken in the thick subtropical scrubs at Rosewood, Queensland, in September.

Crob. chrysidiella, *n. sp.*

♂ ♀. 2½″-2¾″. Head, palpi, antennæ, and legs snow-white. Thorax snow-white, with a yellowish spot on shoulder. Abdomen white, beneath with a yellowish band. Fore-wings white, with a yellowish, longitudinal, central streak from base to beyond middle, and with three oblique, yellowish, costal streaks and one dorsal; first costal streak long, very oblique, from ¼ of costa to apex of central streak, anteriorly margined with blackish scales; second rather beyond middle, third at ¾, shorter and less oblique, posteriorly margined by slender blackish lines, which are sometimes alone distinct; dorsal streak in middle, anteriorly margined by a slender, blackish line, sometimes alone visible, meeting apex of central streak; a faint yellowish spot at anal angle, containing a circular, thickened, silvery-golden metallic spot; cilia white, with a slender bent blackish line round apex terminating abruptly just beyond it. Hind-wings and cilia white.

Allied to the preceding, but with additional yellowish markings from base, and on costa and hind-margin. Common at Sydney and Newcastle from January to April, and in July and August, in dry scrub amongst different species of *Banksia (Proteaceæ)*, on which the larva must feed. I have found rather commonly a larva mining blotches in upper surface of leaves of *Banksia serrata*, which I conjectured to belong to this species, but they proved difficult to rear, all drying up.

BUCCULATRIX, *Z.*

Head roughly tufted on crown, face smooth; no ocelli; tongue very short. Antennæ shorter than fore-wings, filiform, slender, with rather small eyecap. No maxillary palpi. No labial palpi. Fore-wings elongate, narrow, long-pointed, apex somewhat produced. Hind-wings narrowly lanceolate, ⅓ to ½ of fore-wings, cilia 2⅓ to 4 times as broad. Legs slender, posterior tibiæ long-haired. Fore-wings with from 8 to 10 veins; 4 or 5 veins to costa, cell closed, 1 simple. Hind-wings without cell; median three-branched.

Probably a genus of moderate extent, at present represented by about forty rather closely allied species from Europe, and North and South America. The Australian species are very similar to the typical forms, and to one another. The genus may be immediately separated from all others by the roughly tufted head and the absence of palpi. The larvæ are peculiar amongst their allies; sixteen-legged, rough-skinned, mining when very young, but afterwards feeding externally and unprotected on the under side of leaves. Pupa in a silken cocoon, generally characteristically ribbed with raised longitudinal lines.

Bucc. eucalypti, *n. sp.*

♀. 2¾″. Head with dark fuscous hairs on crown, behind whitish, face white. Antennæ white with dark fuscous annulations Thorax whitish-ochreons. Abdomen whitish-grey. Legs whitish-ochreous, tarsi with black rings at base of joints. Fore-win brownish-ochreous mixed with paler, with suffused darker ochreo brown markings ; an obsolete cloudy spot on costa beyond middl a rather larger cloudy spot, suffused with blackish scales, middle of inner-margin ; apical spot minute, linear, black ; cil brownish-ochreous round apex, with scattered blackish poin whitish-grey on hind-margin. Hind-wings fuscous-grey, cil pale grey.

Smaller than the two following species, and distinguish generally by the obsoleteness and suffusion of the markings the brownish-ochreous fore-wings. One specimen bred in Mar from a single larva found at Sydney in February.

Larva of the typical form, pale dull green, head pale brownis feeds on the under side of the leaves of *Eucalyptus sp.*, (probab *tereticornis), (Myrtaceæ),* gnawing the surface of the leaf. Pu in a firm, white, longitudinally five-ribbed cocoon.

Bucc. lassella, *n. sp.*

♂ ♀ . 3½″. Head brownish-ochreous, with a pale stripe each side of crown, and mixed with fuscous hairs ; face whitis ochreous. Antennæ whitish, with strong black annulation Thorax brownish-ochreous irrorated with paler. Abdomen an legs pale brownish-ochreous, tarsi with distinct black rings base of joints. Fore-wings whitish-ochreous, finely irrorat with dark fuscous scales, and with brownish-ochreous ill-define markings ; a central streak from base nearly to middle ; two sho broad oblique streaks from costa, first in middle, second at produced to apical spot ; a fuscous oblique spot on inner-marg beyond middle, and extreme edge of inner-margin more or le distinctly brownish-ochreous ; apical spot irregular, black ; cil ochreous-whitish round apex, with irregular rows of black point pale grey on hind-margin. Hind-wings fuscous-grey, cilia rath paler.

Differs from the preceding by the duller colouring, and the much more distinct and more numerous markings. Four specimens taken on fences near Sydney, in December and January.

Bucc. asphyctella, *n. sp.*

♀. 3¾". Head white, centre of crown with a few fuscous hairs. Antennæ white at base, elsewhere suffused with dark fuscous. Thorax ochreous-whitish, with pale ochreous shoulder-spot. Abdomen ochreous-fuscous, sprinkled with white scales. Legs pale ochreous, tarsi with broad, cloudy, blackish rings at base of joints. Fore-wings dull whitish, with greyish-ochreous markings irrorated with dark fuscous scales; a central streak from base to middle; two oblique costal streaks, first in middle, produced along costa towards base as a very slender streak, second at ¾, ending in apical spot; a narrow irregular streak along inner-margin from base to apex; an oblique streak from inner margin beyond middle, its apex nearly confluent with second costal streak; an irregular elongated black apical spot; cilia whitish with scattered black points, on hind-margin whitish-grey. Hind-wings grey, cilia whitish-grey.

Much paler and more distinctly marked than *lassella*, and distinguished besides by the absence of the black and white annulations of the antennæ. One specimen in dry scrub near Parramatta in October.

The above descriptions include all the species of these families with which I am acquainted as occurring in this region, by whomsoever described. Walker has indeed described three species of Micros under *Gracilaria* as from Australia; one of these I have identified (*G. terminella*, Brit. Mus. Cat,, p. 855), and it is not a *Gracilaria* at all, but one of the *Elachistidæ*, referable to a genus of which I have several other Australian species; it is highly improbable that the other two are correctly referred, but I cannot recognise them. He has also two species under *Gracilaria* from New Zealand; I have identified one (*G. arenosella*, Brit. Mus. Cat., p. 857), and it is a *Batrachedra (Elachistidæ)*. Walker's references of the smaller Micros are entirely haphazard and consequently not in reality worth even a passing notice.

NOTES AND EXHIBITS.

Note on a Block of Shale from the Hawkesbury Sandstone, by W. J. Stephens, M.A.—I desire to bring before the notice of our geological members, a specimen of shale from a boulder embedded in the Hawkesbury Sandstone at Broughton's Pass, where the tunnel between the Cataract and Nepean Rivers, in connection with the Sydney water supply, is now in progress. The point to which I wish to draw attention at present is that the block has before its deposition among the sands, which have ultimately hardened into rock, been subjected to severe strain and pressure in various directions, producing within its structure those smooth striated surfaces, which are known to miners as "Slickensides." The unconformity of these slides shows that they were not produced by any uniform or contemporaneous pressures or movements, and appear to me to corroborate in a very unexpected way the conclusions at which Mr. Wilkinson has arrived as to the existence of a glacial period during the formation of the Hawkesbury Rocks, *i. e.*, posterior to the formation of our upper coal, and probably equivalent to the Permian formations of better surveyed countries. For the irregular and sudden strains which are produced by massive Ice, when drifted by wind or current, forced along the land by pressure, or when slipping and tumbling in huge blocks in consequence of the alteration of their centres of gravity during the process of melting, are precisely such forces as must have produced the phenomena under our notice. Some confirmation may also be found in the absence from the shale thus affected of any of those fossil ferns which appear so abundantly in similar portions of the formation; and in the occurrence of thin laminæ of fine clay, sometimes with a smooth, mammillated surface, suggesting the collection of films of mud upon thawing ice, which are dispersed through the Sandstone at all angles of inclination, and quite uninjured by attrition, as though they had been gently deposited in the sand as the ice which supported them melted away. The bed of stone in which these phenomena occur contains less iron than usual, and while free from the false bedding so common in the series, has the aspect of an artificially stirred up or mixed mass of stuff. There are many other circumstances in the immediate neighbourhood which argue strongly in favour of the hypothesis, and I hope at no distant date to lay these before the Society. It would however, be unreasonable to do this at present, without the specimens to which reference must be made. But, in the interim, we must remind ourselves that the formation is, so far as we know, not at all marine, but entirely from fresh water. If glaciers existed, they must have debouched on rivers or lakes, and not on the sea. But without assuming the existence of actual glaciers, we may suppose that there may have been heavy ice on these rivers and lakes, packing at times, and perhaps occasionally forming dams, whose disruption may have led to the sudden floods of which we have many indications in our Hawkesbury Rocks, which are so very difficult, problematical and obscure to the observer.

Note on a Japanese Drawing of an *Octopus*, by W. J. Stephens M.A.—I have brought for the inspection of members a Japanese work, consisting of a series of illustrations printed in colours, and representing various forms of Japanese industry. Fishing, hunting, weaving, bronze-working, mining, tea gathering, the management of horses and cattle, and many other rural operations are depicted with considerable spirit and apparent accuracy. It is quite evident that the pictures are intended to be realistic, and in no degree imaginary. One cannot, therefore, but feel an unusual interest in the eighth figure, in which we observe an enormous *Octopus*, with eyes not less than two feet in diameter, a body not less than twelve in length, and arms which may fairly be estimated at about thirty feet long. This monster has one of these arms extended over a fishing boat, one of the occupants of which is drawn as in the act of striking with a large knife at this huge tentacle, as thick as a man's body, where it crosses the gunwale. For my own part, I am inclined to suppose that the picture is by no means an exaggeration, but that it is drawn from actual fact. This *Octopus* is not longer than other specimens, portions of which have recently been obtained and subjected to scientific observation on the coast of the North-west Atlantic. It will be seen that he is moving in the normal manner of his tribe, backwards. The break of the sea around his body and arms is plainly intended to indicate this. The colour of both body and arms is a monotonous brownish-drab, very different from the varied and beautiful tints of the smaller octopods. As in these latter their chameleon faculty of changing the colour of their external surface is related to, or (as I should say) designed for, the protection of the weaker individuals, one can readily understand why in such Hydras as this under our eyes all shyness and shrinking from public observation may reasonably have been surrendered. I have entered into these details only because they seem to corroborate the truthfulness of the general representation.

Mr. Stephens exhibited the Block of Shale and the Japanese Pictures referred to above.

Mr. G. Masters.—a very large Fish-hook formed of wood, with sinker of basaltic rock and line of coir fibre, used by the natives of Fiji in catching the large rock fish.

The President—a number of shells from Western Australia, and a *Cassis Achatina* from Bass' Straits, previously known only from Port Jackson.

WEDNESDAY, APRIL 28TH, 1880.

The President, the Rev. J. E. Tenison-Woods, F.G.S., F.L.S., &c., in the Chair.

Visitors present:—H. Selkirk, Esq., and the Very Rev. Dean Lynch.

G. S. Bray, Esq., was elected a member of the Society.

DONATIONS.

From Harvard College.—Annual Report of Curator of Museum of Comparative Zoology, 1878-79. Index to Vol. V. of Bulletin. Bulletin, Vol. V., No. 16.

From Baron F. von Mueller, K.C.M.G., etc., Index perfectus ad Caroli Linnæi, species plantarum.

From Nurlandaise Soc. des Sciences Exactes et Nat. Haarlem, Vol. 14, pars 3 and 5, of their Proceedings.

From Royal Microscopical Soc., London.—Vol. II., parts 3, 4, 5, 6, 7, and 7a.

PAPERS READ.

ON A NEW SPECIES OF *Nepenthes.*

BY F. M. BAILEY, ESQ., F.L.S., CORR. MEM. LINN. SOC.

The order of *Nepenthaceæ* which belongs to Lindley's euporbial alliance of diclinous exogens, is limited to the single genus *Nepenthes*. It is spread over Southern Asia and the islands of the Indian and South Pacific Oceans, but most abundant according to Bentham in the Indian Archipelago. The species are natives of swampy ground, with no known properties, they are only cultivated because of the curious leafy sack or pitcher as it is called, which is formed at the extremity of the leaves. This has obtained for them the name of "Pitcher plants." The organ itself has given rise to some controversy among botanists as to which part of the plant was the leaf and which the petiole or footstalk. The recent investigations of Hooker have shown that the pitcher is a modification of a gland at the termination of the midrib. About twenty species are known, some of which have the pitchers of large size, and some have pitchers of two kinds. The only Australian species hitherto known is *N. Kennedyi*, described by Baron v. Mueller in the fifth volume of the '*Fragmenta Phytographiæ*,' and he says it is distinguished from all the other species known to him by the peculiar venation which give the leaves a tesselated character. This peculiarity is shared by the species I now describe. Mr. Bentham is doubtful as to whether *N. Kennedyi* is more than a variety of the widely-spread *N. phyllamphora*, from which it differs in the much more slender peristome of the pitcher. It is found in the extreme north of the Cape York peninsula, whence specimens have been brought down, and are now growing luxuriantly in the gardens of the Queensland Acclimatization Society, Bowen Park, Brisbane. My attention was drawn a few days ago by Mr. Bernays, the President of the Society, to some luxuriant specimens which he thought differed from the ordinary species *N. Kennedyi*. On examining these plants I found them to consist of two evidently distinct species, one of which appears to me to be new. I have therefore distinguished it with the specific name of *Bernaysii* on account of the great interest taken by that gentleman in everything relating to the botany of Queensland. I forward herewith a leaf bearing ascidium or pitcher that the members may have an opportunity of comparing the two species. The flowers and fruits of both are unknown as yet, but from the appearance of the Bowen Park plants we may hope before very long to see them fruiting side by side. The following is the diagnosis.

Stems *procumbent, clothed with the clasping bases of the petioles.* Leaves alternate, almost crowded, linear-lanceolate, with the *shor* winged petioles, one foot to thirteen inches long and about two inches broad, with five faint longitudinal veins on each side of the midrib, sprinkled with black dots and close adpressed hairs of white color. Midrib produced six or seven inches beyond the lamina, *not curled* but shortly recurved and bearing an ascidium three to four inches long, inflated at the base, the *two anterior ribs winged* with wings 1½ to 2 lines broad, colored and prominently ciliate towards the truncate top, posterior wing somewhat faint, ending in a hooked spur. Operculum ovate, with numerous small reddish glands on the inner side. Peristome narrow and slender, marked with close, transverse lines.

Habitat, Cape York, whence it was sent by a correspondent some few years ago to the Queensland Acclimatization Society.

ON A FOSSILIFEROUS BED AT THE MOUTH OF THE ENDEAVOUR RIVER.

BY THE REV. J. E. TENISON-WOODS, F.G.S., F.L.S., PRESIDENT OF THE LINNEAN SOCIETY, N.S.W.

The mouth of the Endeavour River is a wide estuary forming a bay which is entered by crossing a sandy bar. The north side of the entrance is a flat sandy beach. The south side is a granite hill about 900 feet high. On the land side this granite hill is broken through by a volcanic dyke, very like some of the older tertiary dolerites of Victoria and New South Wales. The granite hill is called Grassy Hill, and it was upon this which Captain Cook encamped while repairing the "Endeavour," more than a hundred years ago. It is very steep on the side facing the sea, but in front of it inside the bar there is a mass of large boulders derived from the volcanic dyke. These are covered with the usual littoral shell-fish of these latitudes, namely *Planaxis sulcata, Nerita polita, Nerita albicella, Acmæa marmorata,* &c. The shingle round these boulders is much mingled with sand and tropical shells, and occasional fragments of coral. The latter is much worn and broken, and is evidently derived from some of the reefs, the nearest of which is about eight miles away. The township of Cooktown is built on the slopes of Grassy Hill at less than a mile inside the bar, where the volcanic dyke ceases and where the hill is less steep. Some short time since the corporation had occasion to make some excavations at the foot of the hill and not very far from the volcanic dyke. At a depth of ten feet a deposit of coral debris was reached, consisting of broken fragments such as we only meet now very close to a coral reef or at its surface. It was of entirely a different nature from the shingle now being deposited around the trap boulders.

I examined the debris carefully, and found it consisted of existing species of *Madrepora*, *Fungia*, *Turbinaria*, *Pavonia*, *Seriatopora*, *Favia*, *Pocillopora*, *Solenastræa*, *Galaxea*, *Mussa*, &c. I could not trace any difference either in the size or character of the fossils, but some of the species are more common than those of the neighbouring reefs. The fragments were not much rolled as coral usually is when it forms shingle beds. It was stained a reddish colour, no doubt derived from the alluvium above it, which was derived from the decomposed trap. The level of the deposit was about three or four feet above the present water level and about a dozen yards from where the waters now reach. There is no living coral growing anywhere near these beds, the nearest reef from which the formation has been derived must have been near, and all traces of it have now disappeared. There must have been also some alteration in the levels, probably upheaval, though it is but slight. We cannot easily suppose that the bed of the estuary has shifted. The fresh-water stream connected with it, that is to say the Endeavour River and its tributaries is too insignificant to effect the formation of the estuary. At present I do not see any way of accounting for the deposit, except by upheaval and the consequent destruction of the coral. The fact is of great importance, because if established it is the only instance of a raised beach which has hitherto been recorded on the whole of the north-east coast of Australia. I cannot give any idea of the extent of the beds. They had been partly covered over at the time of my visit. The coral had been found so useful as road metal and for lime-burning purposes, that the material was removed in large quantities, This was causing considerable injury to the roads and wharves, so the government ordered the quarries to be filled in. The beds are of course recent, but from the thickness of the alluvium which covered them they must be of considerable antiquity. We have reasonable ground for supposing that some changes have taken place even since Captain Cook's time. He relates having found an abundance of turtle on an island reef which is known now as the turtle reef. A portion of it used to be always uncovered, but now it is only at low water springs that any of the reef is laid bare, and it is consequently quite abandoned by turtles. They only frequented the locality for the purpose of laying their eggs, for which they choose dry sandy places.

Another circumstance worthy of mention is that immense patches of floating pumice, are met with at times inside the Barrier Reef. They are with marine animals and exuviæ of all kinds, but especially the internal skeleton of a species of *Sepia*. This pumice from its appearance must have been a long time in the water. It need hardly be added that it could not have come from any part of Australia. It may be connected with some of more recent volcanic outbreaks of the Pacific Islands. Fragments of the same stone are frequently found in the shingle and sands on the beaches of the whole of north-east Australia. I looked very carefully among the coral debris of the formation here described, but could not find any traces of pumice or volcanic stone.

NOTES ON A NEW VARIETY OF *Bulimus Caledonicus*.

By J. Brazier, C.M.Z.S., C. M.R.S., Tas., M.C.S., G.B. and
etc., etc.

Placostylus Caledonicus.

1845.	*Bulimus*	*Caledonicus*,	Petit. Revue. Zool., p. 53.
1848.	,,	,,	Pfr. Mon. Helic. Viv. Vol. II., p.
1853.	,,	,,	Pfr. Mon. Helic. Viv. Vol. III., p.
1855.	*Placostylus*	,,	Ad. Gen., Vol. II., p. 153.
1859.	*Bulimus*	,,	Pfr. Mon. Helic. Viv. Vol. IV., p.
1860.	*Placostylus*	,,	Albers, Die. Heliceen, I., p. 185.
1863.	*Bulimus*	,,	Gassies, Faune Conch. Nouv, Cal I., p. 44.
1864.	,,	,,	Crosse, Journ. de Conch., Vol. X p. 121.
1868.	,,	,,	Pfr. Mon. Helic. Viv., Vol. VI., p.
1870.	,,	,,	Marie, Journ. de Conch., Vol. XV p. 382.
1871.	,,	,,	Gassies, Faune Conch., Nouv. C II., p. 77.
1874.	*Placostylus*	,,	Tappar-Canefri, Malac. Viag Magenta, p. 85.
1877.	*Bulimus*	,,	Pfr. Mon. Helic. Viv. Vol. VIII., p.

Var. *B. edentula*, wanting the prominent characteristic c tubercle on the upper part of the columella that is so com in the typical form; longitudinally, finely striated, nearly sm covered with a thin shining periostraca; peristome much thi and slightly reflected, broad sinus above, contracted in the cen columella, lip and interior of aperture bright dark red. L 34; breadth, 17; height, 15; aperture, 15 lines long.

Hab. Coumac or Kumac, West Coast of the Island of Caledonia.

This very interesting variety of *Bulimus Caledonicus* was obta in the ranges of Tiebagi, a series of mountain ranges near north end of the island by my kinsman Mr. George Rossiter, in the year 1878; the five specimens that I have received do not show any signs of any tubercle on the upper part of the columella. I believe a specimen was sent to Mr. G. B. Gassies, of Bordeaux, some time back, and I am informed by Mr. R. C. Rossiter of Nouméa, that it was pronounced by him to be a variety of *Bulimus Caledonicus*. I distinguish the variety in future as *edentula*, the typical form has been found at Congouma by Monsieur E. Marie, Jouebo, (R. P. Lambert).

NOTES AND EXHIBITS.

Note on *Malurus leuconotus*, Gould, by E. P. Ramsay, F.L.S., &c.—As the habitat of this rare species is not generally known I have the pleasure of recording the fact of Mr. James Ramsay of Tyndarie, having obtained specimens in the Burke district, along with *Malurus leucopterus*, *M. calainus*, *M. Lamberti*, and *M. melanotus* *Amytis striatus* has also been obtained by the same gentleman along with *Sphenostoma cristata*. The Australian Museum has received a skin of the white-backed *Malurus* from Mosgiel, so that the true habitat of this bird *(M. leuconotus)* may be said to be the central and western portion of New South Wales, and probably the northern boundary of South Australia.

Note on the egg of *Eclectus polychlyrus*, by E. P. Ramsay, F.L.S. —I have also the pleasure of exhibiting the eggs of *Eclectus polychlorus*, recently presented to the Museum by Mr. Andrew Goldie. Its total length is 1·58 in., breadth 1·2, color of a glossy-white, oblong, and rather pointed, under the lens the shell is pitted and minutely granular at the larger end; five eggs are laid for a sitting in the hollow limb of a tree, the young nestlings are of the same red and green plumage of their parents; the ♀ red, the ♂ green.

The President exhibited specimens of *Nepenthes Kennedyi*, an *N. Bernaysii*, and photographs of a new *Lycopod* from the Tioo Mines, Queensland.

Mr. T. A. Tenison-Woods—a *Hydrophis (sp.)* from Java.

Mr. G. Masters—an *Antechinus fuliginosus*, with five young i its pouch.

Dr. Cox—a portion of the nest of White Ants in which imbedded two eggs of a large species of iguana or *Hydrosauru* Also a small Australian Truffle *(Melita Australis)*, a fungus use as food by the Blacks.

Mr. Palmer—a collection of Fungi collected at Burwood.

Mr. Brazier—the *Bulimus Caledonicus* and *edentula* referred in his paper. Also Tryon's Manual of Conchology, Vol. I., *Cephalopora*, and Parts 1 and 2 on the genus *Murex*.

◆

WEDNESDAY, MAY 26TH, 1880.

The Vice-President, W. J. Stephens, Esq., M.A., in the Cha

MEMBERS ELECTED.

H. Selkirk, Esq., Petersham.
P. G. King, Esq., Sydney.
P. McMahon, Esq., Sydney.
Rev. Dr. Woolls, Richmond.
Augustus Simson, Esq., Tasmania.
Very Rev. J. J. Lynch, Campbelltown.
Dr. Gilhooley, Oxford Street.

DONATIONS.

From H. C. Russell, Esq., B.A., "Climate of New Sout Wales, 1877," "Rain Observations, 1878." "Rain and Rive Observations, 1879."

From Dr. Woolls, "Plants indigenous to the Neighbourhoo of Sydney.

From Harvard College, "Bulletin of Museum of Comparative Zoology, Vol. VI., No. 3.

PAPERS READ.

ON THE HABITS OF SOME AUSTRALIAN ECHINI.

BY THE REV, J. E. TENISON-WOODS, F.G.S., F.L.S., PRESIDENT OF THE LINNEAN SOCIETY, N.S.W.

In 1877 I published in the Proceedings of this Society a list of the Australian *Echini* known to me. I was not able at that time to add very much about their habits, a defect which in the present paper I propose to remedy to some extent. It may be remarked that not much is known about the habits of most of the species. In the elaborate work of Agassiz on the *Echini* there is a chapter on their habits, but it is very short. What it says may be summarized in a few words. It states that they are gregarious, that some live on the sand, that others bury themselves in cavities of the rocks which they scoop out for themselves, and that a few adhere to the rocks by their powerful suckers. Very little more is added, but probably because facts of a more detailed kind did not come within the scope of the work. I find also on looking through the works of the greatest modern writers on *Echini*, such as Lovén, Verril, Desor, Dujardin, and Hupe, that little is said about the habits of the living species. I regret that I am not able to add very much myself, and my facts will only have reference to the most of our own species, but still I am in hopes that before long I shall be able to add much more. The dredge has been so little used on the Australian coast that a great many of the species whose habitat is far from the land are only known from specimens which have been cast up upon the sea-beach. This is especially the case with *Phyllacanthus annulifera*. *P. dubia*, lives on a sandy bottom at a depth of from six to ten fathoms. Its food or its mode of life are unknown. As far as I know, it prefers tranquil sandy bays and partially enclosed waters. It seems to be very common all round the Australian coast. In Port

Jackson it is very common; Mr. Ramsay dredged up specime of all ages and sizes from off the sandy bottom. It is equal common in Moreton Bay, and a good number of specimens ha been brought down from Port Darwin in North Australia. cannot notice any difference between the specimens brought fro these widely separated localities. Like all the species of *Echi* it is gregarious, and the "flocks" are confined to localities whi are often far apart. In a former paper I have given the reaso which induce me to separate *P. dubia* from *P. parvispina* nobis, species distinguished especially by its more numerous a comparatively smaller spines.

Goniocidaris is a form which has two representatives in Austral Yet very little of its habits is known. The common species *G. tubaria*, Lamarck. It is occasionally washed up on the bea after storms, and is often covered with *Bryozoa*. It would appe as if it loved sandy situations, and from the fact the specime come ashore singly we may suppose that it is not gregarious.

Diadema setosum, Gray, is a species that has a very wide rang It is very common on many of the Pacific Islands and in t Indian Archipelago. I have seen specimens from Java. It common all along the Barrier Reef and on the islands within I have always found it in rocky pools at the side of the pillars dead coral which go by the name of "Nigger Heads." delicate spines are so long, slender, and brittle, that I shou imagine it must always keep on soft sandy places. But it m be found sometimes adhering by its suckers to the rock unde ledge where there is a wide sweep for its beautiful spines. Wh in this position it is nearly impossible to obtain the specim uninjured. The spines break at the least touch, and if the ha is brought incautiously near they penetrate it in all directio breaking and leaving the fragments in the flesh. Fortunat the serrated edges are turned towards the point of the spine, that the splinters work themselves out of the skin quite easil In this genus the anal system is closed by a thin naked membra and the anal orifice is prolonged into a fleshy tube which extends like a proboscis beyond the central plates. In the living specimens this tube is swollen out like a large eye, a resemblance which a rim of colour round the centre makes still more striking. It is very difficult to pursuade the fisherman that this is not an eye, and it makes the beauty and singular appearance of the animal much more conspicuous. Small examples of an urchin which looked very much like this species have been found in Port Jackson, and I was disposed to regard them as the young of *Diadema setosum*. But as the species is not found elsewhere in the tropics the Port Jackson urchins may be the young of *Centrostephanus Rodgersii*, which abounds in the harbour. The spines were more slender than in the adult state of *Centrostephanus* but the color and markings of both genera are the same. It is a matter that will require further examination.

Echinothrix calamaris, A. Agassiz, is rarely found on the Australian coast and only so far as is known on the north-east within the tropics. The specimens found by me were obtained in turning over dead blocks of coral on the inner edge of the Barrier Reef, and on the coral islands. I never saw it adhering by its suckers to anything. When exposed by turning over the stone which sheltered it, the spines were spread equally in all directions around it and moved slowly away. The spines are of two kinds. Those attached to the primary tubercles are rather stout and long with blunt points. They are of pale sea green colour with bands of purple-brown. The other spines are of various lengths, some equalling the primaries and as fine as hair, of a golden lustre with bands of darker colour. These are terrible as weapons of defence. Fine as they are they penetrate the flesh at the least touch. The first *Echinothrix* I ever handled sent its hair spines right through some of my fingers. I cannot help thinking that it has some way of striking with the spines, as I thought I approached the animal quite gently, and had scarcely more than touched it when my hands were wounded.

None of the wounds bled as the puncture is so very fine. It useless to try to extract the fragments as they break into piec as soon as they enter the flesh. I suffered no inconvenience fro them after a day or so, and don't know what became of them.

Centrostephanus Rodgersii, A. Agassiz, is one of the few speci which appears to have a very restricted habitat. It is comm at Port Jackson and Botany Heads, and on the coast betwee but I do not know of any other place where it is found on t east coast. Doubtless this is only because we know so very litt of the coast fauna. When a closer examination is made oth habitats will surely be found. It is a very handsome urchin the deepest purple, or almost black colour. The spines seem a of one kind, and being rather stout are closely packed, besid being long and gracefully tapering. They are grooved wit transverse rings or serrations, hollow and so thin that a ver slight touch breaks them. The test also is very thin and easil destroyed. The animal generally lives in rocky crevices or ove hanging ledges. It clings to the rock with its powerful sucker with the surface free. It is very careful to select as a place repose a very narrow cell with just room enough for its body The projecting spines can be seen, but it is only on the rare occasions that it can be drawn from its recess uninjured. I adheres with great tenacity, and any attempt to detach it crushe the spines and the test. It emerges from these fastnesses to fee on the sandy bottom when the tide is in. It can then be easil captured and is often overtaken by storms and thrown up on th beach in a nearly perfect condition.

Astropyga radiata, Leske, has a very soft thin test and a fe short thin spines. It seems to feed on the mud, but I kno nothing more of its habits. Its only Australian habitat is i Torres Straits, and then few specimens were found together.

Heterocentrotus mammillatus, Klein., does not seem to be rare o the Australian coast wherever coral reefs are found. Its habi are much the same as *Echinothrix calamaris*. It lives among th blocks of dead coral or at least searches for its food amongst them. Though the spines are stout and the test is uncommonly strong, it is very difficult to detach it from the crevice in which it wedges itself. The only specimen seen by me in this way was in a narrow groove or furrow on the side of a *Solenastræa.* Its beautiful brown spines with their bands of white and orange made it a conspicuous object, the water was too deep for anything but a long boat-hook, and then with every effort I could not detach it. The species has a very wide range throughout the Pacific.

Echinometra lucuntur, Leske. This is certainly the most common urchin throughout the tropics, and I believe it is as common in the Pacific as it is in Australia. I always found it under stones or blocks of dead coral upon the reefs. I never saw it attach itself to any object, but it moves rather quickly for an urchin when its hiding place is discovered. Hundreds can be gathered at every low tide upon the reefs. Sometimes as many as half a dozen will be found under a single block of stone. The colour is very variable, and guite different from the appearance presented by dried specimens in cabinets. The younger individuals are a delicate fawn colour, and then there is every variation from pale grey to black, or black and white. It is seldom that in a group two urchins are of the same colour. I don't know of any species which offers greater facilities for the study of the habits of sea urchins. Its abundance on places where it can be easily observed and its habits all favour remarks on its life history. In this and the preceding species, it does not seem to me, that there are any suckers around the actinosome, or at least that they do not attach themselves to any object by means of them. In all those urchins which attach themseles I notice a great flatness about the actinosome and the ambulacral pores are spread out over a much wider surface, I presume it is by means of the tubes of these areas, that the animal fixed itself firmly to the surfaces of the rock. In *Heterocentrotus mammillatus* and *Echinometra lucunter,* the region round the actinosome is rounded.

Stomopneustes atropurpurea, nobis. This species is very like *S. variolaris*, Lamarck, found both in the Indian Ocean and in the Pacific. When I made my first list of the Australian *Echini* the only Australian species known to me was in the Australian Museum and there was no record as to its habitat. Since then I have found a large number of specimens at Port Douglas, Trinity Bay, in about Lat. 16° N. All that were obtained by me lived on one small patch of rocky shore fronting a peninsula called Island Point, which is not more than a mile in extent. Had I not found a fragment of a broken test upon the beach I should never have known that it could be found in that locality. I don't know of any urchin which hides itself more skilfully. It chooses a large immoveable boulder for its shelter, and buries itself in the deepest recess it can find underneath, and only those recesses which are almost closed in on every side. It was only after a lengthened search made by stooping low down and peering under every boulder that at last I was rewarded by seeing a few dark spines projecting out of a dark crevice. It was far out of reach of my hands so I had to content myself then with knowing that I had found the sort of hiding place I had to look for. I then procured a stout iron pot-hook which I fastened to the end of a bamboo. With this I imagined I could easily get them out of the crevices. But I was entirely mistaken. Some of them would not yield to all the force I could employ, and some after a prolonged effort were got out and entirely destroyed. There was no scarcity of specimens. Once I knew where to look for them I discovered them on every side, but only to renew my disappointment in trying to dislodge them. In four or five instance I was able to move the stones on which they were, and I found that they were so firmly attached by their suckers as not to be pulled away by the hand. Any attempt in this way only broke the spines. But by passing a knife underneath they were easily lifted up, and then they would commence to move off slowly on the tips of their spines, which throughout the whole order serve the purpose

In all I was able to get about two dozen specimens,
any of them more or less damaged. Altogether it
greeable kind of fishing. The rocks are covered
nd balani, and one requires strong leather gloves
seriously cut by the thin edges of the shells which
the surface. In my first attempt to capture a
my hands were covered with blood in a few minutes.

e same species occur in Port Denison, and I dare
ther places along the coast, because it may be so
ked in its hiding place, and so much of the coast
lightly examined, that I should not be surprised to
very abundant. It is I think nearly certain that the
ve in Australia is not the same as that described as
y Lamarck, and figured by Agassiz in his "Revision
" In the first place our Australian specimens are
sometimes twice the size of any figured or described.
ur is entirely different. The spines and test except
are of a very deep purple-black colour, while in the
Indian specimens they are green and purple. The
ve at the vertical suture which belongs to the genus
raved. The arrangement of the tubercles is slightly
l the shape of the madreporiform body which is
dded with small glossy milliary tubercles. Yet with
rences the points of resemblance with *S. variolaris*,
n this species, and in fact with nearly every urchin
, when plunged into fresh cold water a purplish
to exude abundantly from the test, and I have some-
t that these animals might have a colour bag such
umphii, *Scalaria australis*, and many species of *Sepia*.

ntrotus eurythrogrammus, Valenciennes. Though we
ave three species of this genus in Australia, yet this
e to be the only one usually met with. It has a very
and like *Echinometra lucunter* varies a good deal in
the spines. Its habitat is in the clefts and crevices

of rocks to which it adheres by its suckers. It is very common on the rocks near Bondi, outside the Heads, but difficult to obtain from the way in which it wedges itself into crevices. All the specimens are of a light chocolate-brown. The spines are long and sharp and require to be very carefully handled.

Sphærechinus australiæ, A. Agassiz. This is one of the most beautiful sea urchins, from the brilliancy of the colouring of the spines. I believe it has been found near Port Jackson, but as I have only seen a very few species and never obtained one alive, I know nothing of its habits.

Temnopleurus toruematicus, Klein. This is not only one of the oldest known urchins, but it is one of the most widely diffused. It is very common on all sandy beaches in the tropics, but probably extends all round Australia. Professor Tate of Adelaide sent me a specimen which came from South Australian waters. On the north bank of the Endeavour River there is a long sandy beach outside the bar, on which a surf is always beating. This I found strewn for miles with the same species in September 1879, and think there was seldom any beach I visited within the tropics where I did not obtain specimens. At Townsville I used to get a good many living individuals, washed up by the surf. It evidently lives on sandy ground and will bear a considerable amount of tossing by the waves without injury. In the full grown urchins the test is of a dull yellow colour, and the spines of a dark green intermingled with colorless ones. They are very sparingly scattered over the test. From the fact of finding so many in one place I should think it went about on the sea bottom in herds. I never saw any on the coral reefs nor near a rocky coast.

Salmacis. I am of opinion that all our Australian species of *Salmacis* will need a thorough revision. The one I considered as *S. bicolor*, Agassiz, varies very much from the diagnosis and figures in the "Revision," I think we may certainly say that we have another species besides those enumerated by Mr. Agassiz, y be more. With regard to *S. rarispina*, Agas., to add to its known habits. It is rather common und upon a sandy bottom. I obtained it recently nison, and in many places as far south as Moreton

bulus, Agass. In my list given last year in the of this Society, I expressed a doubt as to the f the Australian habitat for this species. I have t on the matter as I have found a specimen on a n Trinity Bay.

tes ovum, Lamarck. This is the most common of all urchins on the southern coasts, but I do not know if ther to the west or north side of the continent. as been laid on the shape of the test for specific Nothing of this kind can be relied upon. In some *A. ovum* you have a marked pentagonal outline and on from depressed orbicular, to perfectly oval and The pentagonal form is very common in young Among about 200 specimens picked up after a gale he beach at Wollongong, I was able to arrange a of shape and colour, the tints in extreme cases blue, red and yellow shades. It is a gregarious s found only upon sandy coasts. At Guichen Bay ralia, and Lacepede Bay, which is the next bay to ve seen the beach strewn for miles with the tests of f all sizes up to nearly three inches in length. It n shell and is easily broken. It is common on all tralian coast as far as Spencer's Gulf, and is often ads for ornamental purposes. The color of the test ingly, almost every shade may be met with, but the prevailing tint. I cannot help thinking that *A. pallidus* may only be varieties of this species.

d to all the species of *Holopneustes*, I am still obliged have seen none on the Australian coast, though I have been taking an interest in our *Echini* for many years. There is no species known to me in any of our Museums in any of the colonies.

Echinus Darnleyensis, nobis. Since I described this species I have seen other specimens from different parts of the East Australian coast. It is very gregarious and goes, I should imagine in shoals on sandy bottoms. I sent specimens to Professor Alexander Agassiz, of Cambridge Mass., and he tells me that the species was known to him and he always regarded it as a variety of the South American *E. magellanicus*. But as that species differs from mine in some important particulars, is not known to occur outside American waters, we may perhaps regard ours as distinct.

Hipponöe variegata, Leske. I have already remarked the very variable character of this species, but I am more disposed than ever to regard the large individuals which are found occasionally in Port Jackson as distinct species. The described light violet or blue variety is not at all uncommon inside the Barrier Reef. Every specimen met by me was denuded of spines and cast high and dry amid the debris on the sand and coral shingle, which is found on one side of every reef. It is always a most conspicuous object of light violet or lilac colour. The white tubercles and the markings of the coronal sutures giving it a most elegant appearance. These features and the very deep actinal cuts easily distinguish it.

Evechinus chloroticus, Vernl. This seems to be rather a common species in New Zealand, judging from the facility with which specimens are obtained. The spines are short and stout, and of a uniform green colour. I know nothing of its habits, but should be inclined to think that it took in New Zealand the place which is occupied by *Strongylocentrotus eurythrogrammus* in Australia. Two small and young specimens were found near Port Jackson.

Echinanthus testudinarius. In my list of *Echini* I have stated that this species is found fossil in the Murray River beds, but y has shown that the living form is distinct, though it in many respects. It has a very wide range and is mon. Prof. Agassiz called my attention to the of the species and has suggested that my *E. tumidus* of the varieties. But the two species are so entirely at the matter will not bear discussion. I intend to gure of *E. tumidus*, and then this will I think be put oubt. I have found *E. testitudinarius* all along the lian coast, both within and outside the tropics and ticed any great variability in its character, in fact I e said that it is one of the exceptionally constant species a. I obtained one small example from Moreton Bay, sented to the National Museum Melbourne, which had le depression in one of the petals, but this arises clearly formation. The specimen is dwarfed and depressed, erwise different from the normal type.

depressum, Lesson, and *L. Bonami*, Klein, are both mon on sandy situations, but the species of this genus *lla* are so extremely alike that unless the interior of the mined they cannot be referred with certainty to any ecies.

decagonalis, Lesson, is found of large size at Port d on sandy places all along the inside of the Barrier xtends to Port Jackson, but there it is only very small. e tropics it is very large and of a blood red colour. ry much depressed at the edges, and seemingly thin it has a very strong test, and is seldom found broken. he sea bottom covered with sand, so that without a cimens are not easily obtained.

r humilis, Leske. A very fine specimen of this urchin ed by Messrs. Haswell and Morton, in Port Denison. first time it has been found on the Australian coasts.

chnius parma, Klein, is not so common on the northern supposed, but *Arachnoides placenta*, Linn., is very plentiful. At the mouth of the Endeavour River the coast was strewn with dead and broken tests of the species. Using a very small dredge at about ten fathoms one can obtain hundreds or thousands of specimens anywhere between Cape Grenville and Port Denison.

Maretia planulata, Leske, is also a very common species and is found on a sandy bottom at moderate depths from about five fathoms. We know very little about the *Spatangidæ*, but their habits might be easily studied in Sydney with even a small aquarium. The peculiar smooth actinal plastron points no doubt to some distinct habits and modes of getting its food, which would be very interesting to study. Though it is not at all rare on the east coast, yet because the test is very brittle it is never found on the beach. Any specimens that are washed up must be broken to pieces. This shows how nothing but the dredge will reveal what urchins we have in Australia.

Echinocardium australe, Gray. This species is abundant on sandy shores, from Port Jackson to East Tasmania. Like all the clypeastroid urchins it seems to feed on Foraminifera.

Breynia australasiæ, Gray, is extremely abundant in the sandy shallow bays about Port Denison.

Rhynobrissus apicalis, *nobis*. Small specimens of this urchin have lately been found in Port Jackson at sixteen fathoms. They were not one-fourth the size of the type specimen obtained by me from Moreton Bay.

DESCRIPTIONS OF AUSTRALIAN MICRO-LEPIDOPTERA.

BY E. MEYRICK, B.A.

IV. TINEINA, (Continued).

The present instalment treats of the families *Glyphipterygidæ* and *Erechthiadæ*, giving descriptions of fifty-three species, of which number forty-two are new to science. One species appears to have been introduced, sixteen are confined to New Zealand, the remaining thirty-six are confined to Australia. Before giving the descriptions, I will offer some general remarks upon the classification of the families forming the subject of the paper.

Amogst the *Glyphipterygidæ* I have included the genera *Simaëthis* and *Choreutis*, usually separated by European entomologists as a distinct family, under the title of *Choreutidæ*. These insects have long been held to be of doubtful location, but our recent increased knowlege of the group has caused unprejudiced minds to have little hesitation in referring them at least to the neighbourhood of of the *Glyphipterygidæ*; so near do they come to this family in structure that no definite point of distinction can be alleged, except the abnormally broader wings, a variable and insufficient character. I am decidedly of opinion that there is no ground for separating the two families; were they regarded as distinct, it would certainly be necessary to form a third family for the Australian genera *Hypertropha*, *Eupselia*, and *Aeolocosma*, which are allied to but differ from both. Perhaps this might eventually be done, but at present I think it would be at least premature. It must be admitted, however, that it is hardly pssible to define the family as a whole so as to distinguish it from the *Oecophoridæ*, to which it comes nearest. The best points on which to rely consist in vein 1 of fore-wings not being furcate at base, veins 7 and 8 not being stalked, and the antennæ of ♂ not being conspicuously ciliated; but to all these points there are several exceptions, though I think one or more will always be found to hold. The characters of the *Oecophoridæ* proper (which family I hope shortly to take in hand) are remarkably uniform in themselves.

Of the *Glyphipterygidæ* three European genera occur here, but only two (*Simaëthis* and *Glyphipteryx*) are represented by native species, the single species of *Choreutis* being doubtless introduced and tolerably cosmopolitan. The development of the genus

Glyphipteryx is remarkable, the number of species found in tl
regions already exceeding all those known from the rest of
world, nor do I think that future discoveries will reverse
proportion. Besides these I have been obliged to form five
genera, two of these being nearly allied to *Glyphipteryx*,
other three forming a group together. The group of *Glyphipt*
appears especially predominant in New Zealand, where t
numbers are out of all proportion to those of other familie
Tineina, compared with the standards of other regions;
Glyphipterygidæ collected by myself on my New Zealand jou
formed about a twelfth part of the *Tineina* obtained, whils
Europe they constitute about a hundred and eightieth.

The other family, the *Erechthiadæ*, is new, and contains five
genera, which I have been compelled to form for the recep
of a peculiar group of species, which will not harmonise
any previously established family. It is in my opinion rel
to the *Glyphipterygidæ*, although in point of structural chara
it certainly approaches nearer to the *Tineidæ*. The following
be a general summary of its characteristics:—

ERECHTHIADÆ, *nov. fam.*

Head rough, tufted between eyes (face smooth in one gen
rather uncertain position). Ocelli present. No tongue. Maxil
palpi well developed, folded. Labial palpi rather short or mode
porrected or drooping, generally roughly scaled or ha
Antennæ shorter than fore-wings, in ♂ not ciliated.
moderate, posterior tibiæ usually clothed with long hairs. F
wings elongate-lanceolate, rarely with distinct hind-ma
Hind-wings rather narrower than fore-wings, lanceolate,
long cilia. Fore-wings with 11 (rarely 12) veins, subcostal
obsolete towards base; secondary cell indicated; 1 simpl
furcate at base; 6 and 7 separate, or more rarely stalked. H
wings with 8 (or rarely 7) veins, subcostal obsolete towards b

5 and 6 stalked or separate. Larva sixteen-legged, feeding internally on seeds or bark.

The normal type of markings consists of a pale central longitudinal streak and oblique costal and dorsal streaks on a darker ground. Structurally, as mentioned above, the family approaches the *Tineidæ*, especially in the rough head and folded well-developed maxillary palpi; the head is however less rough behind, and especially tufted on the forehead, where the hairs commonly form a projecting ridge; all the wings, especially the hind-wings, are narrower and more lanceolate, though there are exceptions; vein 1 of fore-wings is often not furcate; the obliteration of the subcostal veins of both wings on their basal halves appears to be a constant character; the type of markings is quite different, and approximates in principle to that of the *Glyphipterygidæ*. I am aware that these points hardly afford sufficient justification for the creation of a new family; but the insects themselves assort so ill with the *Tineidæ*, that I prefer to regard them provisionally as a distinct group, believing that science will be better served by an attempted arrangement, even if it be proved hereafter faulty, than by throwing all together into a heterogeneous mass. The group as constituted is at least natural in itself.

The family is probably of some extent in the Australian region, though not at present known to me as occurring elsewhere. I have described ten Australian and six New Zealand species, and have every reason to believe that many more remain to be found, especially in New Zealand, where the typical genus *Erechthias* seems to be dominant.

I purpose reserving until I come to treat of the *Oecophoridæ* (where they will have an especial significance) some remarks on the meaning and value attached to the group called a family, with reference to the difficulty of limiting these groups when natural by any fixed definition of characters.

GLYPHIPTERYGIDÆ.

The eight genera hiterto found in Australia may be tabulated as follows :—

I. Hind-wings broader than fore-wings.
  A. veins 7 and 8 of fore-wings stalked .. Hypertropha
  B. veins 7 and 8 of fore-wings separate.
    1. second joint of palpi roughly scaled beneath .. .. Simaëthis
    2. second joint of palpi with long, erect bristles beneath .. .. .. Choreutis
II. Hind-wings narrower than, or hardly as broad as fore-wings.
  A. second joint of palpi beneath smooth, with appressed scales.
    1. fore-wings with 11 separate veins .. Eupselia
    2. fore-wings with 12 veins, 7 and 8 stalked Aeolocosma
  B. second joint of palpi beneath roughly scaled in somewhat projecting whorls .. .. Glyphipteryx
  C. second joint of palpi with long, loose, projecting hairs, tuft-like.
    1. veins 7 and 8 of fore-wings stalked .. Apistomorpha
    2. veins 7 and 8 of fore-wings separate .. Phryganostola

HYPERTROPHA, *n. g.*

Head smooth; with ocelli; tongue moderate. Antennæ half as long as fore-wings, filiform, simple. No maxillary palpi. Labial palpi short, recurved, second joint with appressed scales, terminal joint slender, hardly acute. Thorax with a bifid crest behind. Fore-wings very broadly triangular, less than twice as long as broad, costa rounded, apex somewhat produced, hind-margin waved, hardly oblique. Hind-wings rounded-triangular, slightly broader than fore-wings, cilia short. Abdomen short, rather stout. Legs short, stout, anterior and middle tibiæ thickened with dense scales, posterior tibiæ clothed with dense long hairs. Fore-wings with 12 veins; no secondary cell; 1 strongly furcate at base; 7 and 8 long-stalked, going to either side of apex. Hind-wings with 8 veins; 2 and 4 from posterior angle of cell.

The genus may be recognised by the very unusually broad wings, the crested thorax, and amongst those nearest to it by the stalking of veins 7 and 8 of fore-wings. In shape of wing it resembles *Simaëthis*, but surpasses it in breadth; in the palpi, and black hind-marginal spots it has affinity with *Eupselia* and *Aeolocosma*. The only species at present known is brilliantly marked; it flies in the hot sunshine with rapidity, and is then difficult to see; in repose the wings form a broad nearly flat roof, and are not raised as in *Simaëthis*.

Hyp. thesaurella, *n. sp.*

♂ ♀. 7½‴-8‴. Head, palpi, and thorax dark fuscous, densely and irregularly mixed with ochreous and pale scales. Antennæ of ♂ ochreous-fuscous, of ♀ ochreous annulated with dark fuscous. Abdomen dark fuscous, lateral margins yellow. Legs dark fuscous, indistinctly ringed with ochreous; posterior tibiæ yellow. Fore-wings black, basal half almost entirely occupied by four transverse, rather outwardly curved, almost confluent faint ochreous-whitish bands, composed of numerous very fine transverse strigulæ, these bands being very obscurely separated by slender black lines, only distinct as black spots on costa, where also the pale bands are usually more distinct; a small ochreous-whitish spot on costa in middle, giving rise to an indistinct orange-ochreous transverse line marking off the basal half, and itself immediately followed by a metallic bluish-purple line of raised scales; immediately preceding the ochreous line are three small metallic bluish-purple raised spots, one on inner-margin, one above and one below middle; and at about ⅓ from base is a transverse metallic blue raised line from middle of disc perpendicularly to inner-margin, interrupted on fold; an outwardly curved metal blue-purple line from ¾ of costa to anal angle, lower h interrupted to form three spots near and parallel to hin margin; lower ⅔ of space between this and central line strew with ochreous-whitish scales, especially towards inner-margi beyond this line is a white outwardly oblique spot on cost emitting a faint band of transverse whitish strigulæ along hin margin to anal angle, leaving three elongate black spots o lower part of hind-margin; beyond this band is an outwardl oblique orange-ochreous subapical spot from costa; cilia a extreme apex black, beneath apex with an oblong transverse snow-white spot, thence metallic blue-purple. Hind-wings deep yellow, with a broad black margin; cilia yellow, with a black basal line.

This richly adorned insect cannot be confused with any other Its habits are truly sun-loving; it sports in the hottest sun-shin over the tops of young trees of *Acacia decurrens*, to which it appear certainly attached. Taken occasionally in New South Wales a Parramatta, and at Waratah on the lower Hunter; also a Melbourne and Brisbane, from January to March.

SIMAËTHIS, *Leach.*

Head smooth; with ocelli; tongue strong. Antennæ abo half as long as fore-wings, filiform, in ♂ ciliated. No maxillar palpi. Labial palpi moderately long, recurved, second joi beneath with rough scales often forming a small apical projection terminal joint compressed, rather shorter than second, blun Fore-wings broadly-triangular, apex somewhat produced, hind margin slightly oblique. Hind-wings broader than fore-wing triangular, cilia short. Abdomen short, stout. Legs short broadly compressed, tibiæ densely scaled. Fore-wings with 1 veins; no secondary cell; 1 furcate at base. Hind-wings with veins; 7 and 8 remote, 3 and 4 sometimes stalked or coincident.

Larva sixteen-legged, active, living in a web within a drawn-together leaf; pupa in a firm white cocoon.

This genus, though by no means large, is distributed throughout the world, but seemingly more commonly towards the tropics. In repose the imago rests with the fore-wings slightly raised and partially expanded, so as not to entirely conceal the hind-wings.

Sim. sycopola, *n. sp.*

♂ ♀. 5½″-6½″. Head and thorax deep ochreous-brown, irrorated with whitish scales. Palpi black, at base ochreous-whitish, second and terminal joints clothed each with three whorls of black white-tipped scales. Antennæ black, annulated with white, in ♂ with long ciliations. Abdomen dark fuscous, strewn with orange-ochreous scales. Legs dark fuscous, densely irrorated with ochreous-whitish; middle and posterior tibiæ suffused above with orange-ochreous, densely clothed with hair-scales expanded in whorls in middle and at apex; tarsi white with four black bands. Fore-wings strongly dilated, hind-margin slightly waved; dark fuscous, faintly suffused with orange-ochreous posteriorly, most distinctly at apex and along hind-margin; two cloudy transverse bands of finely-strewn purple-whitish scales; first from ⅓ of costa to ⅓ of inner-margin, slightly waved above middle, well-defined anteriorly only; second indistinctly double, from ⅔ of costa to just before anal angle, sharply angulated outwards above middle, below which the inner portion is thrice sharply and irregularly toothed; fine purple-whitish scales are strewn near base, on disc between first and second bands, and between the second band and orange-ochreous hind-margin except on costa; cilia dark fuscous, with paler reddish-ochreous-tinged spots above and below middle. Hind-wings orange, with costa irregularly black and a large black spot at apex, whence proceeds a straight narrower black band above hind-margin to anal angle, whence it is continued broadly along inner-margin to base, becoming mixed with orange towards margin; cilia fuscous with a paler line near base, orange beneath apex.

Immediately recognisable from its Australian allies by the orange hind-wings; it comes nearest to *S. taprobanes*, Z., from Ceylon, which has similar hind-wings, but distinct ferruginous-orange markings on the fore-wings. The imago appears in March and again (apparently a second brood) in May, flying in the sunshine for about half-an-hour at sunset round *Ficus stipulata*, a climbing fig grown commonly over garden walls in Sydney, and native in tropical Australia. Larva slender, cylindrical, greyish-ochreous marbled with rather darker; dorsal brownish-ochreous, irregular; head pale ochreous. Feeds in a web within partially folded leaves of *Ficus stipulata*, in February and April. Pupa pale olive-greenish, in an elongate spindle-shaped firm white cocoon, placed on upper surface of leaf beneath a flat white covering web.

Sim. melanopepla, *n. sp.*

♀. 6″-6½″. Head and thorax deep ochreous-brown, irrorated with whitish scales in irregular transverse lines. Palpi white at base, second and terminal joints clothed each with three whorls of black white-tipped scales. Antennæ black, annulated with white. Abdomen deep ochreous-brown, segmental margins with a few white scales. Legs dark fuscous, densely irrorated with white; middle and posterior tibiæ densely clothed with hair-scales expanded in whorls in middle and at apex; tarsi white with four black bands. Fore-wings strongly dilated, hind-margin slightly waved; dark fuscous, tinged with ochreous towards base, more blackish posteriorly, with clondy whitish markings caused by the aggregation of black white-tipped scales; a few scales at base, and a slender transverse fascia near base; a broad nearly straight transverse band at ⅓, and a very broad rather outwardly curved band from ⅔ of costa to before anal angle, the two bands almost confluent on lower half, leaving a triangular blackish costal spot; an orange-ochreous streak on costa near apex, continued round apex along hind-margin to anal angle; cilia fuscous, black at base, with a paler line. Hind-wings blackish-fuscous, rather lighter towards base; cilia blackish-fuscous, with a black line near base.

Very similar to the preceding in all respects except the blackish hind-wings; the fore-wings are also darker and the markings rather clearer.

Two females taken on garden fences in Sydney, in November.

It is very probable that the larva of this species also is attached to some one of the several cultivated species of *Ficus*.

Sim. combinatana, *Wkr.*, Brit. Mus. Cat., 456.

♂. 6½″. Head and thorax deep ochreous-brown, with a few white scales. Palpi white at base, second joint clothed with four whorls of black white-tipped scales, terminal joint black with three slender white rings. Antennæ black, annulated with white, in ♂ with long ciliations. Abdomen blackish, with a few whitish scales. Legs dark fuscous, thickly irrorated with whitish, tarsi with indistinct whitish rings, posterior tibiæ clothed with dense hair-scales. Fore-wings slightly dilated, hind-margin distinctly waved; blackish-fuscous, tinged with reddish-brown on costa beyond middle, and within each pair of transverse lines; some purple-whitish scales irregularly arranged transversely near base; four transverse cloudy lines of purple-whitish scales, arranged in pairs, and starting from small white costal spots; first pair from ⅓ of costa to ⅓ of inner-margin, rather curved outwards, irregularly toothed; second pair from ⅔ of costa to just before anal angle, angulated outwards beneath costa, but indistinct and irregular; a streak of purple-whitish scales from apex very near but not on hind-margin, reaching to middle; a second similar streak from middle of hind-margin, immediately beyond end of first, continued along hind-margin, not extending to anal angle; cilia dark fuscous containing a cloudy white basal spot above and another below middle of hind-margin. Hind-wings rather narrow, hind-margin strongly sinuate below middle, anal angle prominent; dark fuscous, broadly blackish along hind-margin, with two rather short cloudy parallel streaks of blue-whitish scales, one nearly along hind-margin at anal angle, the other immediately above it; cilia white on the hind-marginal sinuation, becoming gradually smoky-fuscous towards apex and on anal angle, black at base throughout.

The narrower wings and more sinuate margins give this species a very different figure to the two preceding, with which it cannot therefore be confused. It is very nearly allied to the well-known European *S. oxyacanthella*, L., (*fabriciana*, Steph.), from which it would appear to be best distinguished by the deep sinuation between anal angle and middle of hind-margin, by the much less distinct double bluish-tinged streaks of the hind-wings, and the deeper tint of the fore-wings.

Two males taken amongst forest growth at Wellington, New Zealand, flying towards sunset; in January. Walker's specimens are merely stated to be from New Zealand.

CHOREUTIS, *Hb.*

Head smooth; with ocelli; tongue strong. Antennæ about half as long as fore-wings, filiform, in ♂ ciliated. No maxillary palpi. Labial palpi moderately long, recurved, second joint beneath with long dense projecting bristles; terminal joint slender, pointed. Fore-wings broadly triangular, hind-margin straight. Hind-wings broader than fore-wings, triangular, cilia very short. Abdomen short, stout. Legs short, broadly compressed, posterior tibiæ densely scaled. Fore-wings with 12 veins; no secondary cell; 1 furcate at base. Hind-wings with 8 veins; 7 and 8 remote; 3 and 4 sometimes stalked or coincident.

This is a very small genus, of which the species described here is almost universally distributed, but has probably been transported through the medium of civilisation. In habits the species resemble *Simaëthis*, and the imago holds the fore-wings slightly raised in the same manner.

Larva sixteen-legged, living in a web between drawn-together leaves. Pupa in a firm cocoon.

Chor. bjerkandrella, *Thnb.*

♂ ♀. 4″-5″. Head grey, face tinged with yellow. Palpi white, second joint grey on side with two black rings before apex, beneath with long blackish and white diverging bristles, terminal joint blackish. Antennæ black, annulated with white, in ♂ with moderate ciliations. Thorax yellowish-ferruginous, with five longitudinal metallic grey-silvery lines. Abdomen black, with silvery-white rings. Legs white, tibiæ with central and apical black bands, tarsi with four black bands. Fore-wings moderately dilated, apex and hind-margin rounded; dark fuscous, basal third yellowish-ferruginous, except on margins and a central longitudinal streak; two short metallic-silvery streaks from base along the costal margin and central streak; two cloudy whitish transverse bands, first from ⅓ of costa to ⅓ of inner-margin, rather curved outwards, furcate on inner-margin; second from ⅔ of costa to before anal angle, angulated outwards above middle; the space between these is irregularly sprinkled with whitish scales; two round black blotches immediately preceding second band, one on inner margin, the other below middle, each containing an elongate metallic purple-silvery mark, that in the upper one being three-pointed; several other metallic purple-silvery markings, consisting of an elongate mark on inner margin of second band above middle, a small costal spot between the two bands, an elongate mark on hind-margin below middle, preceded by an elongate black blotch, a spot on costa immediately beyond second band, and an elongate mark round apex: cilia dark grey, with a pale line in middle and another before tips, tips white round apex. Hind-wings dark fuscous, blackish towards apex, with a white elongate spot on disc beyond middle, parrallel to hind-margin, and sometimes another less distinct white spot above it on costa; cilia blackish, with two white lines.

I have thought it well to redescribe from Australian and New Zealand specimens this species, which is well-known in Europe, doubtless its home. The same species (subject to local variations) has been recorded also from South Africa and South America. In New South Wales it occurs round Sydney, at Shoalhaven, Murrurundi, Blackheath (3,600 feet), and Bowenfels, but rather sparingly; also at Melbourne, and in Queensland at Rosewood and Toowoomba; always more or less casually. In New Zealand however, I met with it on the swampy thistle-grown plains at Hamilton, on the Waikato, in immense profusion, swarming on the thistle-blossoms in the sunshine, in January. In Australia it occurs from September to January.

In Europe the larva feeds on *Inula*; probably in other parts of the world it is not restricted from other *Compositæ*; in New Zealand at least it must certainly feed on the thistle.

I do not see any tangible difference between Australian, New Zealand, and South European specimens.

EUPSELIA, *n. g.*

Head smooth; with ocelli; tongue moderate. Antennæ much shorter than fore-wings, filiform, simple. No maxillary palpi. Labial palpi short, recurved, not reaching vertex, second joint with appressed scales, terminal joint slender, acute. Fore-wings elongate, rather broad, costa gently arched, apex rounded, hind-margin oblique, rounded. Hind-wings elongate-ovate, as broad as, or slightly narrower than fore-wings, cilia moderate. Abdomen moderate. Legs moderate, posterior tibiæ clothed with long hairs, anterior tibiæ sometimes thickened with scales. Fore-wings with 11 veins; no secondary cell; 1 furcate at base. Hind-wings with 8 veins; 3 and 4 from posterior angle of cell.

The only larva as yet known is sixteen-legged, slender and active, and mines in galleries in leaves, with peculiar accessory habits; pupa naked, erect, attached by the tail.

The genus is the only one in the family, in which the fore-wings have only 11 veins. Its nearest ally is the succeeding genus *Aeolocosma*, from which it differs in the antennæ of ♂ being quite simple, and in the neuration. The round black metallic-edged hind-marginal spots are a remarkable secondary characteristic, (shared also to some extent by *Aeolocosma* and *Hypertropha*,) which is very constant and trustworthy. In repose the imagos rest with the wings forming a rather sloping roof; *E. aristonica* extends the furry anterior legs in front, but this habit is not shared by the rest. The species are all more or less retired and sluggish in habit, and hence appear not common.

The genus is peculiar to Australia, so far as known. Probably it contains a considerable number of species; the seven here described may be thus tabulated :—

- I. Hind-wings yellow at base.
  - A. Fore-wings with a dark fuscous blotch on inner-margin .. ..4. beatella
  - B. Fore-wings without dark fuscous blotch on inner-margin.
    - 1. with three black hind-marginal spots 3. carpocapsella
    - 2. with five black hind-marginal spots..6. theorella
- II. Hind-wings wholly fuscous-grey or blackish.
  - A. Fore-wings brownish-ochreous, irrorated with whitish .. ..7. melanostrepta
  - B. Fore-wings with basal half yellow, apical purple .. ..5. satrapella
  - C. Fore-wings blackish.
    - 1. with white spots near base of inner-margin and on costa .. ..1. aristonica
    - 2. without white spots .. .. ..2. percussana

Eups. aristonica, *n. sp.*

♂. 6″. Head dark fuscous, face rather lighter. Palpi fuscous, mixed with whitish towards base. Antennæ dark f Thorax dark fuscous, with a small whitish indistinct s middle of lateral margin. Abdomen black with indistinct yel rings, anal tuft ochreous-yellow. Anterior and middl blackish-fuscous, beneath mixed with whitish, anterior much dilated with hair scales; posterior legs pale ochreous-y base of tibiæ and basal rings of all tarsal joints black. wings rather broad, hind-margin rather slightly oblique; dark fuscous, almost black; a square white spot on inner- near base, anteriorly somewhat suffused, its upper anterior connected with two short suffused white streaks, one runn centre of base, the other to costa near base, followed by scattered whitish scales; a small rectangular white spot on of costa, divided into two by a transverse dark fuscous line half giving rise to a leaden-blue metallic line, proceeding p directly across wing; a leaden-blue metallic spot before th inner-margin; a leaden-blue metallic line from middle immediately beyond them to anal angle, interrupted bene apex; beyond this line are thickly strewn very fine longit whitish hair-scales; a very small white spot on costa before giving rise to a short outwardly oblique leaden-metallic lin with a small leaden-metallic spot beneath it; extreme ochreous-orange; four circular black spots on lower half o margin, surrounded by a few pale ochreous scales, the upp spot small; a violet-metallic line along hind-margin on cilia, rest of cilia dark fuscous. Hind-wings blackish-fu cilia ochreous-yellow, with a darker line near base.

Not to be confused with any other species; in repose th legs are extended. One specimen beaten from dry scru Parramatta in December.

Eups. percussana, *Wkr.*, Brit. Mus. Cat., 998.

"♂. 7″. Head, thorax, and abdomen cupreous-blackish. Fore-wings with hind-margin moderately oblique; cupreous-blackish, with transverse cinereous lines, some of which posteriorly are blue-metallic; disc near hind-margin with minute longitudinal cinereous hair-scales; hind-marginal dots deep black, partly bordered with metallic blue. Hind-wings cupreous-blackish; cilia pale cinereous. Tasmania."

The above is Walker's description, divested of superfluities and interpreted; brief and incomplete as it is, it is sufficient to clearly indicate a species of this genus distinct from any I have seen. I thought it best therefore to include the descriptions of this and the following species in the present paper, to direct attention towards them, and render the subject as complete as possible.

Eups. carpocapsella, *Wkr.*, Brit. Mus. Cat., 998.

"♀. 7″. Head, thorax, and abdomen slaty-cinereous. Fore-wings rounded, slaty-cinereous, posteriorly cupreous-tinged, with transverse brown streaks, interrupted towards the base, but complete posteriorly, and forming the ground-colour along hind-margin; three deep black cupreous-bordered spots on lower part of hind-margin; cilia slaty-cinereous, tinged with cupreous. Hind-wings yellow, with a very broad dark fuscous border, excavated interiorly; cilia partly yellow. Brisbane, Queensland."

The description is Walker's, similarly treated as the preceding; I have not seen the specimen, but it is certainly an *Eupselia*, nearly allied to *E. beatella*, but without the dark fuscous triangular patch on inner margin.

Eups. beatella, *Wkr.*, Brit. Mus. Cat., 999.

♀. 6½″. Head, palpi, and thorax pale ashy-grey, crown and upper portion of thorax suffused with dark fuscous. Antennæ pale grey. Abdomen yellowish-fuscous. Legs whitish, anterior and middle tibiæ thickened with scales; anterior tibiæ and tarsi suffused above with dark fuscous; middle tibiæ with two suffu fuscous rings, tarsi with fuscous rings at base of joints; poste tibiæ yellowish, tarsi pale yellowish with indistinct fuscous ri at base of joints. Fore-wings moderately broad, hind-mar rather oblique; very pale ashy-grey; six short cloudy grey stre from costa before middle, the first two uniting with two sim streaks from inner-margin; a large rounded-triangular clea marked dark fuscous blotch on inner-margin slightly bel middle, reaching half across wing; two parallel nearly strai grey lines crossing wing from slightly beyond middle of cost just before anal angle; beyond the second line the apical port of the wing is entirely dark fuscous, intersected by a strai leaden-metallic line from above midde of disc to anal angle, ne parallel to the second line; and by a cloudy ashy-whitish li strongly curved outwards, from ¾ of costa to anal angle, prece by thickly strewn longitudinal whitish hair-scales on disc be middle; a similar cloudy slaty-whitish line from costa just bel apex to hind-margin, continued along hind-margin, and coalesc with the first; four oval black spots on lower half of hind-mar uppermost small, each surrounded with a whitish ring; a vio metallic line along base of cilia, rest of cilia dark fuscous. Hi wings pale yellow, with a broad blackish-fuscous border al hind-margin, broadest at apex; cilia dark fuscous, beneath a and on inner-margin yellowish, with a blackish line near bas

Easily known by the dark fuscous dorsal blotch and hi margin on a pale ground, and yellow hind-wings. One ♀ ta at rest on a Eucalyptus-trunk at Sydney, in December; Walk specimen was a ♂ and is simply given as from 'Australia.'

Eups. satrapella, *n. sp.*

♂ ♀. 6½″-7½″. Head and palpi deep yellow. Antennæ d fuscous, indistinctly annulated with whitish. Thorax deep yell anterior margin and a square central spot connected with it d purple-fuscous; in ♀ the whole anterior portion is suffused w fuscous. Abdomen dark fuscous, tinged with yellowish on sides. Legs dark purple-fuscous, posterior tibiæ yellow, posterior tarsi yellowish with dark fuscous rings at base of joints. Fore-wings moderately broad, hind-margin considerably oblique; deep yellow apical portion beyond an inwardly curved line from three-fifths of costa to ¾ of inner-margin purple (light reddish-purple scales being thickly strewn on a black ground, towards anal angle in longitudinal lines); a suffused dark fuscous streak along costa from base to middle; a dark fuscous streak along lower half of division-line of the yellow and purple portions, immediately beyond which are two small deep blue spots one in middle, the other above inner-margin; a broader dark fuscous streak from costa at junction of yellow and purple portions to anal angle, slightly curved inwards, bordered posteriorly on its lower half with purple-blue; a very oblique, short, dark fuscous streak from costal extremity of this streak towards hind-margin a little below apex, above which is a deep purple-blue spot, and the extreme costa is yellow; four round black spots on lower part of hind-margin, surrounded by ochreous scales, and alternating with three smaller longitudinally elongate black spots; a metallic purple line along base of cilia, rest of cilia dark fuscous. Hind-wings dark fuscous; cilia dark fuscous, on costa yellowish.

This very handsome species is superficially very dissimilar to all its congeners from its yellow and purple colouring; in this it has at first sight an external resemblance to some of the *Oecophoridæ* but, apart from structural points, may be known from them by the black hind-marginal spots. It appears tolerably common, though retired in habit; occurring round Sydney and Parramatta, and in Queensland at Helidon, from September to November, and again in February and March.

The larval and pupal stages of this species are very singular. Larva very elongate, tolerably cylindrical but slightly flattened, smooth, head, second and anal segments with a few short blackish bristles; whitish, slightly tinged with greenish-grey; a slender irregular reddish-ochreous line on each side of dorsal space; subdorsal rather broader, darker reddish-ochreous, anteriorly partially double, enclosing irregular spaces of ground-colour; spiracular slender, nearly straight, interrupted, reddish-ochreous; subspiracular similar, more interrupted; spots small, distinct, blackish-grey; head grey-whitish, with three longitudinal rather broad pale amber stripes, mouth blackish; second and anal segments with markings obsolete, anal segment obliquely flattened. When half-grown, all the markings are nearly obsolete, the head and part of second segment blackish. Feeds in a long rather sinuate swollen gallery within leaves of *Eucalyptus, sp.*, issuing by night through a hole and eating substance of leaf outside; by day remaining concealed in the gallery, but traversing it with great celerity if disturbed; found in August and September.

Pupa long, slender, dull brown, wingcases short, whitish, thorax almost angulated on shoulders; quite naked, affixed by the tail, stiffly and perpendicularly projected from the surface of its attachment, so as to be actually standing erect upon its tail. I had several of these pupæ, which were all similarly fastened to twigs and the sides of the glass containing them.

Eups. theorella, *n. sp.*

♀. 6″. Head, palpi, thorax, and abdomen light ochreous-brown. Antennæ ochreous-whitish, annulated with black. Legs light ochreous-brown, anterior tibiæ and tarsi suffused with dark fuscous, post tibiæ and tarsi pale ochreous-yellow. Fore-wings elongate, hind-margin extremely oblique; ochreous-brown, thickly irrorated with paler scales, becoming elongate hair-scales towards lower portion of hind-margin; about ten very obscure and faint transverse streaks from costa, caused by the disappearance of the pale scales, some of them faintly continued to inner-margin; two in middle of wing more distinct, rather divergent on disc, confluent on inner-margin and forming there a transversely elongate metallic-ochreous spot, becoming ochreous-white on inner-margin itself; an oblique ochreous-brown streak from ¾ of costa to hind-margin beneath apex, and an oval ochreous-brown spot at apex; five round black spots very close together below middle of hind-margin; a violet-metallic line on base of cilia, broken into spots, especially towards apex; rest of cilia ochreous-fuscous, towards apex blackish, with two small whitish spots on tips beneath apex. Hind-wings with basal half yellow with a few scattered dark fuscous scales; apical half dark fuscous, sending a cloudy protuberance inwards above middle; cilia blackish-fuscous, on costa yellowish.

This and the following species differ from all the preceding by the much more oblique hind-margin of fore-wings; the two are nearly allied, but immediately separable from each other by the different hind-wings.

Two females taken amongst dry scrub at Parramatta in November.

Eups. melanostrepta, *n. sp.*

♂ ♀. 6‴. Head, palpi, and thorax ochreous-whitish, mixed with ochreous-grey. Antennæ ochreous-whitish, annulated with dark fuscous. Abdomen ochreous-grey. Legs ochreous-whitish, anterior and middle pair irrorated with grey. Fore-wings elongate, hind-margin very oblique; brownish-ochreous, so densely irrorated with ochreous-whitish scales that the ground-colour is entirely obscured, except on a few faint transverse streaks; two more distinct transverse ochreous-brown streaks in middle from costa to inner-margin, divergent above middle, approximated on inner-margin, where they enclose a small white spot; before these the inner-margin is obscurely whitish nearly to base; an oblique ochreous-brown streak from ¾ of costa to hind-margin below apex, and an indistinct ochreous-brown oblique streak immediately before apex; surface of wing strewn with ochreous-whitish hair-scales towards lower part of hind-margin;

six round black spots very close together on hind-margin below middle; a violet-metallic line on base of cilia, broken into roundish spots, especially towards apex; rest of cilia smoky-fuscous. Hind-wings and cilia dark fuscous.

Quite of the same form as the preceding; the forewings more suffused with ochreous-whitish, and therefore paler, with an additional black spot, the hind-wings wholly dark fuscous. Several specimens taken by Mr. G. H. Raynor at Melbourne, and also at Brighton in Tasmania, in January.

AEOLOCOSMA, *n. g.*

Head smooth; with ocelli; tongue moderate. Antennæ shorter than forewings, filiform, in ♂ ciliated. No maxillary palpi. Labial palpi rather short, recurved, second joint with appressed scales, terminal joint shorter, slender, acute. Fore-wings elongate, moderately broad, costa slightly arched, apex rounded, hind-margin very oblique, rounded. Hind-wings ovate-lanceolate, narrower than fore-wings, pointed, cilia as broad. Abdomen moderate. Legs moderate, posterior tibiæ clothed with long hairs. Fore-wings with 12 veins; 7 and 8 stalked, to either side of apex; no secondary cell; 1 simple at base. Hind-wings with 8 veins; 3 and 4 from posterior angle of cell.

Allied to the preceding genus, and agreeing with it in the palpi, and in the possession of the black hindmarginal spots (though these are obscured in one species), but differing in the strongly ciliated antennæ of ♂, the acute hind-wings, and the different neuration. In these points the genus approaches more nearly to the type of the *Oecophoridæ*, from all of which family it is at once distinguished by vein 1 of fore-wings not being furcate at base, as well as by the secondary character of the black hind-marginal spots. In markings and shape of fore-wings the genus approximates to *Eupselia*. I have as yet only two species, confined to Australia. The larvæ are unknown.

In repose the imagos rest with the wings forming a sloping roof; they fly slowly towards sunset in sheltered places.

Aeol. iridozona, *n. sp.*

♂ ♀. 4¾"-5½". Head, palpi, and thorax, dark fuscous mixed with grey. Antennæ dark grey, in ♂ with moderately long dense ciliations. Abdomen dark fuscous. Legs dark fuscous, posterior tibiæ paler and with ochreous-whitish hairs, all tarsi with indistinct whitish rings at apex of joints. Fore-wings elongate, rather narrow, hind-margin extremely oblique, apex broadly rounded; ochreous-grey, strewn with ochreous-whitish scales; two slender straight golden-ochreous black-margined transverse fasciæ, one immediately on each side of middle of wing, perpendicular to costa, and enclosing a slender pale silvery-grey space; from the dorsal extremity of second fascia proceeds a third similar golden-ochreous black-margined fascia obliquely to ¾ of costa, its posterior edge bordered by a pale silvery-grey fascia of equal breadth; six nearly square black spots, separated by silvery-whitish scales, on lower portion of hind-margin, very near together and sometimes almost confused, uppermost and lowest smaller than the rest; cilia fuscous-grey, with an indistinct dark line round apex. Hind-wings narrow, ovate-lanceolate, fuscous-grey; cilia fuscous-grey.

This elegantly marked species has a very delicate and fragile appearance; it is very distinct from all others known, It occurs at Parramatta and Sydney in August and September amongst dry scrub, in very sheltered places only; it is tolerably common, but local, and only obtainable towards sunset, when it flies gently close to the ground.

Aeol. marmaraspis, *n. sp.*

♂ ♀. 5¾"-7." Head and thorax deep bronzy-fuscous, tinged with purple. Palpi golden-yellow, terminal joint with a black line beneath. Antennæ dark fuscous, in ♂ with rather long ciliations. Abdomen blackish-fuscous, segments above suffused with ochreous except on margins. Legs dark fuscous, tarsi with slender whitish rings at apex of joints, posterior tibiæ clothed above with long whitish hairs. Fore-wings elongate, rather narrow, hind-margin oblique, apex rather acutely rounded; dark fuscous, coarsely strewn with pale golden-ochreous scales; a short deep golden-yellow longitudinal streak of hair-scales from base, posteriorly suffused into a cloudy spot of whitish scales on disc before ⅓, which is faintly expanded to costa and inner margin, forming an obsolete band; a straight rather oblique obsolete band of whitish (in some lights bluish) scales from costa before middle to just before anal angle, where it forms a small distinct white spot; a rather large clear white rectangular spot on costa at ¾, from which proceeds a cloudy band of pale leaden-blue scales towards hind-margin above anal angle; a few leaden-blue scales on hind-margin beneath apex; some irregular black scales along lower ⅔ of hind-margin, tending to form obscure broken spots; cilia dark metallic grey, with ochreous reflections. Hind-wings elongate-ovate, dark fuscous-grey; cilia dark fuscous-grey, with an obsolete darker line near base.

In shape of wing this species approaches many of the *Oecophoridæ*, and the black hind-marginal spots being ill-defined, it would be difficult of location if the neuration were not examined. Specifically it is very distinct; the golden-yellow palpi, and basal line of fore-wings are marked characters; though not brightly coloured, it is a handsome insect. I have only found it on the swampy grass-covered ledges which project from the face of the perpendicular precipice that overhangs the Grose Valley by the waterfall at Govett's Leap, near Blackheath, 3,500 feet above the sea. Here it is common in November, flying languidly in the sunshine over the tops of the long grass.

GLYPHIPTERYX, *Hb.*

Head smooth; with ocelli; tongue moderate. Antennæ much shorter than forewings, slender, filiform, in ♂ pubescent or very shortly ciliated. No maxilliary palpi. Labial palpi rather short;

thick, arched; second joint laterally compressed, often roughly scaled beneath; terminal joint as long as second, pointed. Fore-wings elongate, variable in breadth, hind-margin often indented, oblique, apex rounded, often produced. Hind-wings varying from ovate to lanceolate, narrower than forewings, cilia rather narrower or broader. Abdomen rather elongate. Legs rather short, smoothly scaled. Forewings with 12 veins; secondary cell indicated; 7 and 8 separate; 1 simple or more or less furcate at base. Hind-wings with 8 veins; 3 and 4 from posterior angle of cell, sometimes short-stalked.

The genus may always be recognized by the short palpi clothed with whorls of scales, and metallic transverse markings; it is a very conspicuously natural one, and not very close to any but *Phryganostola* and *Apistomorpha*, which have a long tuft on second joint of palpi. All the species have the same habit of alternately raising and depressing their wings when at rest, as though fanning themselves; I have noticed this habit in all the Australian and New Zealand species. They are sun-loving insects, and fly especially in the afternoon towards sunset, in grassy places.

The genus is apparently of universal distribution, but hitherto not numerous in species, 17 having been described altogether from other parts of the Globe; 18 are here described from Australia and New Zealand, where doubtless many more remain to be discovered, so that these regions would appear to be especially favoured by them. The proportion appears to be largest in New Zealand.

The larvæ are 16-legged, rather stout, and feed principally on the seeds of grasses and allied plants, except one European species on *Sedum*. I have not yet succeeded in finding the larvæ of any Australia species, but from the habits of the imago, I have little doubt that all will be found to feed in the seed-heads of different species of grass and sedge.

The following is an analytical table of the 18 species:—

I. Fore-wings without sharp apical hook in cilia.
A. Hind-wings bright yellow with fuscous margin .. ..1 Chrysolithe
B. Hind-wings wholly fuscous-grey.
1. Fore-wings with a black patch towards anal angle.
a. A white complete transverse fascia close to base .. .. ..6 Asteriella
b. A white transverse spot on inner margin near base.
*. Black patch narrow, containing 4 metallic spots in a row ..5 Triselena
**. Black patch broad, containing 5 or 6 irregular spots.. ..4 Iometalla
c. No white spot or fascia close to base.
*. With a fan-shaped posterior patch of ochreous lines ..3 Cometophor
**. Without such patch .. ..2 Atristriella
2. Fore-wings without black patch ..7 Euastera

II. Fore-wings with a sharp black apical hook in cilia.
A. Fore-wings with two conspicuous pale spots on inner margin.
1. Spots yellow .. ..10 Chrysoplan
2. Spots white.
a. First spot extending to costa ..9 Meteora
b. Both reaching to middle of wing only.
*. Third costal streak meeting anal streak, forming a curved fascia .. .. ..12 Asteronota
**. Third costal streak not united with anal streak .. ..11 Leucocerast

B. Fore-wings with a slender white streak from middle of inner margin . . 13 Actinobola

C. Fore-wings with four indistinct silvery-white streaks from inner margin . . 8 Sabella

D. Fore-wings grey, with a black streak from middle of inner margin . . 16 Acrothecta

E. Fore-wings without dorsal markings before anal angle.

1. Fore-wings dull dark bronze . . 14 Palæomorpha
2. Fore-wings grey, slightly bronzy-tinged . . . . 15 Iochesera
3. Fore-wings bright coppery-bronze.
    - *a.* With a complete curved fascia beyond middle . . . . 17 Astrapæa
    - *b.* With costal and anal streaks not united . . . . 18 Transversella

Glyph. chrysolithella, *n. sp.*

♂ ♀. 4¾''-7''.—Head dark fuscous, behind mixed with ochreous. Palpi ochreous-yellow, second joint with three flattened whorls of black yellowish-white tipped scales, terminal joint black at base and with a black longitudinal line beneath. Antennæ dark fuscous. Thorax dark fuscous, paler on sides. Abdomen dark fuscous, with indistinct yellowish rings, anal extremity yellow. Legs dark fuscous, posterior tibiæ with a central yellowish band, posterior tarsi with two apical joints and basal rings on the others yellowish. Forewings broad, hind-margin nearly straight, very slightly sinuate above middle; dark ochreous-bronze, with a few pale scales towards disc; an obscure whitish transverse spot on inner margin near base; a violet-golden metallic streak from costa at ⅓, not oblique, reaching middle of wing; a rather shorter similar streak from inner margin immediately beyond it; two minute whitish spots on costa before and beyond middle, giving rise to indications of metallic

streaks; a white spot on costa at ⅔, giving rise to a st
oblique violet-golden metallic streak, reaching middle of
a similar opposite streak from anal angle, almost meetin
a rather broad black longitudinal streak on disc, extendin
apex of first costal streak to apex of streak from anal
obtusely toothed above beyond middle, containing two
large roundish violet-golden metallic spots on its lower m
projecting beyond it, and a much smaller similar spot be
and above them; an ochreous-white spot on costa at five-
and another immediately before apex, both giving rise to o
violet-golden metallic streaks reaching middle of hind-m
one or other of which often unites with a violet-golden m
streak nearly along lower part of hind-margin almost t
angle; between ⅔ and five-sixths is an oblique blackish
from costa to middle of disc; cilia with a very strong blac
almost at base, grey, at apex and anal angle black, with a
white spot on middle of hind-margin, and a small one just
anal angle. Hind-wings trapezoidal, moderately broad; g
yellow, hind-margin very broadly blackish; cilia golden-y
on hind-margin black at base.

This splendid species is distinguished from all others
genus by the yellow hind-wings. It is local, but occurs
commonly on the ledges of the precipice at Govett's
Blackheath, flying slowly in the sunshine in March; a
Campbelltown, Sydney, and Parramatta; and I have
specimens from Tasmania.

Glyph. atristriella, Z. Hor. Ross., 1877, p. 398.

"♂. 6½". Head and thorax brown. Palpi white at
second joint black with white rings, terminal joint black
white longitudinal line. Antennæ fuscous. Abdomen yell
fuscous with broad yellowish rings, anal extremity pale y
Anterior legs fuscous, tibiæ with two white spots, apex of
first tarsal joints whitish; (middle legs broken;) posterio

blackish-fuscous, tibiæ with whitish-yellow central and apical spots, tarsi with apex of first three joints whitish-yellow, two apical joints wholly whitish. Fore-wings rather parallel-sided golden-ochreous, duller towards base, lighter on disc, on inner margin irrorated with fuscous; a strong black longitudinal streak on middle of disc, posteriorly attenuated and bent upwards, with three silvery-metallic roundish spots, one at its origin, one in middle, the third before the extremity beneath; the first of these forms the apex of a rather oblique streak from costa before ⅓, which is followed at equal intervals on costa by a silvery-metallic dot, a short transverse streak, and an outwardly curved transverse fascia, attenuated above middle, ending on inner margin beyond the black discal streak; two white costal spots before apex, each giving rise to a violet-silvery metallic line, half-way across wing uniting into a thick line ending at anal angle. Hind-wings fuscous, towards the base mixed with yellowish; cilia very pale yellowish, tips grey towards apex, and with a grey-fuscous line. One ♂ from Tasmania."

I have not seen this species; I have translated Zeller's original description, which is written with his usual accuracy, and clearly points to an insect rather nearly allied to the preceding *G. chrysolithella*, but without the yellow hind-wings; the markings of the fore-wings are very similar.

Glyph. cometophora, *n. sp.*

♂ ♀. 7‴-9‴. Head bronzy-grey. Palpi whitish at base, second joint clothed with three whorls of black white-tipped scales, terminal joint loosely scaled, black, with an ochreous-whitish line on each side, and an ochreous whitish sub-apical spot above. Antennæ dark fuscous. Thorax brassy-bronze. Abdomen dark greyish-fuscous, with pale ochreous rings beneath, apex pale ochreous. Legs dark fuscous; posterior tibiæ with central and apical whitish bands, posterior tarsi with whitish rings at apex of joints. Fore-wings broad, hind-margin slightly sinuate above middle; ochreous-bronze, with a brassy tin with six complete or interrupted violet-silvery metallic transve fasciæ, second to sixth starting from small whitish spots on cost first from ¼ of costa, rather oblique, reaching to fold sometimes to inner margin; second entire, straight, sligh oblique, on inner margin whitish; third broken in middle, ap of dorsal portion rather beyond apex of costal; sixth from fi sixth of costa to hind-margin just above anal angle, sligh curved outwardly; between third and sixth is an expanded fa like patch of dense diverging pale ochreous lines on a bla ground, its base resting on third fascia a little above middle, a its apex covering the whole length of sixth; the triangu space between this patch and inner margin is jet-black, cut an irregular longitudinal golden-ochreous line; the fourth a fifth fasciæ are visible only as two transverse violet-silvery b on this black space, and the corresponding whitish costal spo a white spot on costa just before apex, sending a violet-silve line to above middle of hind-margin; cilia whitish, gre towards anal angle, dark fuscous-grey at apex, basal half cloth with dense golden-bronze scales, except where a white indentati meets the sub-apical silvery line. Hind-wings and cilia da fuscous.

This handsome species is the largest of the genus, and m be known from all others by its fan-shaped patch of ochreo lines on a black ground, spreading like the tail of a com Common at Melbourne, frequenting rushes; also taken Blackheath, on the Blue Mountains (3,600 feet), in November

Glyph. iometalla, *n. sp.*

♂ ♀. 3‴-3¼‴. Head and thorax deep bronzy-fuscous. Pa whitish at base, second joint with two whorls of black whi tipped scales, terminal joint clothed except apex with a wh of black white-tipped scales. Antennæ dark fuscous. Abdom shining dark grey, beneath silvery. Legs dark fuscous-grey, tarsi with slender white rings at apex of joints; posterior tibiæ with white central and apical bands, posterior tarsi with two apical joints wholly white. Fore-wings short, posteriorly dilated, hind-margin sinuate beneath apex; dark golden-bronze, with transverse golden-ochreous strigulæ; a white transverse rather inwardly oblique oblong spot on inner margin near base, reaching to middle; a silvery-white violet-tinged perpendicular streak from costa at ¼, reaching to middle; a straight silvery-white violet-tinged fascia from just before middle of costa to inner margin at ⅔, expanded and more snow-white on inner margin; a rather large black patch on anal angle and lower half of hind-margin, containing five or six golden-metallic spots, its base not touching fascia, its upper edge margined by a straight whitish-ochreous line, above the posterior part of which are three other whitish-ochreous longitudinal lines, separated by blackish spaces; a silvery-white violet-tinged streak from costa to upper anterior angle of the black patch; two parallel oblique silvery-white violet-tinged streaks from costa a little before apex to hind-margin above middle, becoming white on costal cilia: cilia white, becoming dark grey at apex and anal angle, basal half separated by a dark grey line and clothed with bronzy scales, except where a white indentation meets the anterior sub-apical streak. Hind-wings and cilia fuscous-grey.

This species has a strong superficial resemblance to *Apist. argyrosema*, but apart from structural differences it is smaller, and has only a costal streak corresponding to what in *A. argyrosema* is a second complete fascia. It is allied to the succeeding species *G. triselena*, but is smaller, broader-winged, darker, and the black patch is broader and contains usually six metallic spots instead of four. Tolerably common at Brisbane in September, flying towards sunset in dry grassy places amongst thin gum scrub; from its small size it is rather difficult to see.

Glyph. triselena, *n. sp.*

♂. 4½″. Head and thorax dark fuscous. Palpi white a base, second joint with two flattened whorls of black white-tippe scales, terminal joint black with two white rings. Antenn dark fuscous. Abdomen very long, whitish-ochreous. Leg whitish-ochreous, anterior tarsi with obsolete fuscous bands a base of joints. Fore-wings elongate, narrowed posteriorl hind-margin slightly indented below apex; pale golden-bronze an obscure transverse whitish spot on inner margin near base three silvery-white, obscurely dark-margined transverse fasciæ first from ¼ of costa obliquely outwards, angulated in middle, t inner margin before middle; second and third straight, paralle nearly perpendicular to costa, before and beyond middle; fro third below middle proceeds a rather narrow longitudinal blac band, bent downwards to anal angle, thence continued alon lower half of hind-margin, containing four golden-metallic spo in a row; the space between this and costa is filled by si longitudinal ochreous-whitish lines, partially confluent c separated by narrow black interspaces; two oblique nearl parallel silvery-white sub-apical streaks from costa immediatel before apex to hind-margin above middle, becoming white in th grey costal cilia; some dark, metallic-grey scales at apex, cili whitish, basal third within a fuscous line clothed with pa golden-bronze scales, except where a white indentation mee anterior sub-apical line. Hind-wings pale grey, cilia whitish grey.

Nearest to *G. iometalla* and *A. argyrosema*, but differing fro both in the peculiarly narrowed fore-wings, the much pal colouring, three complete fasciæ, and narrow black patc containing four metallic spots in a straight line. Two mal taken in January on the bare dry grassy volcanic hills ne Christchurch, New Zealand.

Glyph. asteriella, *n. sp.*

♀. 6‴. Head and thorax dark bronzy fuscous. Palpi whitish-ochreous at base, second joint with two flattened whorls of black whitish-ochreous-tipped scales, terminal joint black with two white rings. Antennæ dark fuscous. Abdomen blackish-fuscous, posteriorly with silvery-white rings, anal extremity ochreous. Legs dark fuscous, middle and posterior tibiæ with slender central and apical whitish rings, all tarsi with slender whitish rings at apex of joints. Fore-wings elongate, rather broad, hind-margin sinuate beneath apex; deep bronze, all markings obscurely dark-margined; a clear white irregularly margined transverse fascia close to base, hardly touching costa broadest in middle; an oblique silvery-metallic streak from costa at ⅓, meeting a clear white rectangular spot on middle of inner margin; a silvery-metallic transverse spot on middle of costa, and a similar spot slightly beyond it on disc; a silvery-metallic costal streak at ⅔, bent obliquely inwards, reaching middle, from the extremity of which proceeds a bent longitudinal rather slender black streak to hind-margin above anal angle; above this streak are four short black longitudinal streaks on disc, and below it are two roundish confluent black spots on anal angle; an outwardly oblique silvery-metallic streak from inner margin before anal angle, cutting the first two black streaks; two silvery-metallic parallel sub-apical streaks from costa, becoming white in costal cilia, the anterior nearly meeting a curved silvery-metallic streak from anal angle along lower half of hind-margin, the posterior going to hind-margin below apex; cilia whitish, dark fuscous on costa, apex, and anal angle, basal half separated by a dark fuscous line and clothed with deep bronze scales, except where a white indentation meets the posterior sub-apical streak. Hind-wings somewhat trapezoidal, dark fuscous; cilia dark fuscous.

A handsome species, conspicuously distinct from its nearest allies through the white fascia close to base. One female taken amongst the dense luxuriant forest clothing the steep slopes of mountain overlooking Kangaroo Valley, near Shoalhaven, 1,50 feet above the sea, in January.

Glyph. euastera, *n. sp.*

♂ ♀. 3¼"-3½". Head, antennæ, and thorax dark fuscous Palpi whitish at base, second joint with two whorls of dar fuscous white-tipped scales, terminal joint black with tw white rings. Abdomen blackish-fuscous, beneath silvery-whitish Legs dark fuscous, middle and posterior tibiæ with white centra and apical rings, all tarsi with white rings at apex of joints Fore-wings elongate, very slightly dilated, hind-margin indente beneath apex; basal and apical thirds dark fuscous, densel strewn with whitish scales, central third bronzy-ferruginous more or less broadly suffused with dark fuscous on costa an inner margin; a white oblique costal streak at ⅓, reachin middle, ending in a leaden-metallic spot; an indistinct whit spot on inner margin near base; two outwardly curved steel-blu metallic fasciæ ending in white spots on both margins, fir hardly before, second beyond middle; beyond these are thre white spots on costa, the first two giving rise to obsolete metalli streaks, the last sub-apical, sending a steel-blue metallic strea to hind-margin below apex; a blackish spot on apex; cili whitish, fuscous-grey at apex and anal angle, basal hal separated by a strong dark fuscous line, and clothed toward base with ferruginous scales, except where a wedge-shape dark-margined white indentation meets the sub-apical streak Hind-wings and cilia dark fuscous-grey.

Distinct from all others in the Australian region through th absence of both the black discal streak and the apical hook, a well as by the contrast of the central ferruginous third with th rest of the fore-wings, and the steel-blue markings. Fiv specimens taken on the dry grassy volcanic hills, near Christchurch, New Zealand, in January.

Glyph. sabella, *Newm.*, Trans. Ent. Soc., Lond., N.S. III., 299.

"Fore-wings shining brassy-black, with yellowish scales towards apex; four narrow fasciæ from costa, reaching to centre of wing, silvery white; close to apex two triangular white costal spots; from inner margin rise less distinct fasciæ, almost meeting those from costa; a silvery mark in anal angle; cilia pale brown, a black hook at apex. Hind-wings smoky brown, cilia concolorous. Exp. al. 5½".

Allied to *G. thrasonella*, but costal fasciæ more perpendicular. Two specimens from Mount Alexander Range, Victoria."

The above description is Newman's original one as written; it is palpably insufficient and inaccurate, but appears to denote an insect very different from any Australian species known to me.

Glyph. meteora, *n. sp.*

♂ ♀. 4"-4¾". Head and thorax dark bronzy-fuscous. Palpi whitish at base, second joint with two oblique whorls of black white-tipped scales, terminal joint clothed with two rough whorls of black white-tipped scales, apex black. Antennæ dark fuscous. Abdomen blackish fuscous, beneath with silvery-white rings, apex white. Legs fuscous, middle and posterior tibiæ black with white central and apical rings, all tarsi black with white rings at apex of joints, posterior tarsi with two apical joints wholly white. Fore-wings moderately dilated, hind-margin indented beneath apex; dark bronzy-fuscous; a broad conspicuous white transverse fascia near base, attenuated on costa; a rather large white transverse spot on inner margin rather beyond middle, dilated in middle, reaching half across wing, its apex silvery-metallic; a short oblique silvery-metallic streak from costa rather before middle, nearly meeting the dorsal spot; two other oblique silvery-metallic costal streaks at ⅝ and ¾, reaching middle; an oblique silvery-metallic streak from inner margin just before anal angle, its apex resting between extremities of these two costal streaks; a few irregular silvery-metallic scales on hind-margin above anal angle; two very short silvery-metallic streaks from costa immediately before apex, white in costal cilia, not produced to hind-margin, apex of posterior streak ending in the roundish black apical spot, immediately beneath which is a small golden-metallic spot on hind-margin; cilia white with a strong black apical hook, basal half separated by a blackish line and clothed with bronzy scales, except where a white blackish-margined indentation meets the golden-metallic hind-marginal spot. Hind-wings and cilia dark fuscous-grey.

Nearest to *G. chrysoplanetis*, but distinguished from it and all the other species with black apical hook by the broad white transverse fascia near base, preceding the central white dorsal spot. It appears to be a mountain species, occurring amongst the rich forest-growth on the ascent of the Bulli Pass, and also on the Liverpool Ranges near Murrurundi, in October.

Glyph. chrysoplanetis, *n. sp.*

♂ ♀. 4″-4½″. Head and antennæ dark fuscous. Palpi yellowish at base, second joint with two whorls of dark fuscous broadly yellowish-tipped scales, terminal joint dark fuscous with two yellowish bands. Thorax dark fuscous, with a small yellowish spot on posterior margin. Abdomen dark fuscous, beneath with yellowish bands, apex yellowish. Legs dark fuscous, all tibiæ with oblique yellowish basal, central, and apical bands, tarsi with apex of all joints yellowish. Fore-wings strongly dilated, hind-margin sinuate beneath apex; dark fuscous, almost blackish; two rather large yellow spots on inner margin, first near base, subquadrate, reaching ⅔ across wing, second beyond middle, rounded-triangular, reaching half-way across wing: seven short oblique streaks from costa; first at ¼, second before middle, both yellow; third and fourth steely-metallic, violet-tinged, starting from small yellowish costal spots, third reaching middle of wing, fourth very short; fifth very short, yellowish apex steely-metallic; sixth and seventh close before apex, short, yellow; eight small roundish steely-metallic violet-tinged spots, first just beyond middle of disc, second between first and anal angle, third and fourth beneath extremities of third and fourth costal streaks, fifth on anal angle (these last three are in a straight line), sixth, seventh, and eighth on hind-margin, eighth being just below apex of seventh costal streak; cilia yellowish, with a strong black apical hook, basal half separated by a blackish line and clothed with dark fuscous scales, except where a yellowish black-margined indentation meets the eighth spot on hind-margin. Hind-wings and cilia dark fuscous.

Instantly recognisable from all others by the two conspicuous yellow dorsal spots. A handsome and common species, appearing in October and again much more plentifully in March; it occurs freely on dry grassy banks round Sydney and Parramatta, and also at Melbourne; specimens from the latter place appear somewhat larger; it flies readily in the afternoon towards sunset.

Glyph. leucocerastes, *n. sp.*

♂. 4‴. Head, thorax, and antennæ dark bronzy-fuscous. Palpi white at base, second joint with two oblique whorls of black ochreous-whitish-tipped scales, terminal joint black with two ochreous-whitish rings. Abdomen dark fuscous, apex white. Legs dark fuscous, anterior and middle tarsi with slender whitish rings at apex of joints, middle tibiæ with very oblique slender white central and apical rings; posterior tibiæ with slender white central and apical bands, posterior tarsi with first joint white at base, two apical joints wholly white. Fore-wings moderately dilated, hind-margin sinuate beneath apex; dark fuscous, almost blackish; two conspicuous clear white semilunate spots on inner margin, first near base, second hardly beyond middle, each reaching half across wing, their apices curved towards apex of wing, that of second attenuated; six slender oblique white streaks from costa; first at ⅓; second before middle, very

oblique, becoming obsolete before reaching middle of
third reaching half across wing, its lower portion steely-met
fourth short; fifth and sixth acutely wedge-shaped, close
apex, very short; a short oblique steely-metallic streak
anal angle, forming a white spot in cilia; between its ape
that of third costal streak is a steely-metallic spot on d
steely-metallic line along lower half of hind-margin, and
scattered steely-metallic scales on disc towards apex; cilia
with a strong black, apical hook, basal half separated by a
line and clothed with dark fuscous scales, except on a
shaped black-margined indentation beneath apex contai
small whitish spot. Hind-wings and cilia dark fuscous.

Closely allied to *G. asteronota*, but larger, and the third
streak does not unite with the streak from anal angle. Two
taken on the dry grassy hill-slopes near Murrurun
November.

Glyph. asteronota, *n. sp.*

♂ ♀. 3¼". Head, thorax, and antennæ dark fuscous.
whitish, with obsolete darker rings. (?) Abdomen dark f
apex whitish. Legs dark fuscous, middle and posterior
with whitish central and apical bands, all tarsi with
whitish rings at apex of joints. Fore-wings somewhat
hind-margin rather strongly sinuate beneath apex; dark f
two conspicuous clear white semilunate spots on inner
reaching half across wing, first near base, second slightly
middle, both outwardly oblique, their apices curved t
apex of wing; six slender oblique white streaks from
first at ¼; second hardly before middle, not reaching half
wing; third uniting with a similar streak from anal a
form an outwardly curved transverse fascia; fourth short
and sixth small, wedge-shaped, close before apex; some ir
silvery-white scales above anal angle beyond the tra
fascia; cilia grey (?), basal half separated by a black l

clothed with dark fuscous scales, except on a wedge-shaped black-margined indentation a little below apex, containing a whitish spot. (?) Hind-wings and cilia dark fuscous-grey.

Very similar to the preceding; best distinguished by the smaller size, and complete fascia formed by third costal and anal streaks. Two specimens, in rather imperfect condition, taken at Auckland, New Zealand, flying over damp grass on a shady bank, in January.

Glyph. actinobola, *n. sp.*

♂. 3½″. Head and thorax deep bronze. Palpi white, second joint with two oblique whorls of blackish broadly white-tipped scales, terminal joint black with two oblique white bands. Antennæ dark fuscous. Abdomen blackish-fuscous, beneath snow-white, apex white. Legs dark fuscous, middle and posterior tibiæ with white central and apical bands, all tarsi with slender white rings at apex of joints. Fore-wings narrow, somewhat dilated, hind-margin sinuate beneath apex; dark bronze, with one dorsal and six costal slender white dark-margined streaks; dorsal streak slightly beyond middle, obliquely curved towards apex of wing, hardly reaching ⅓ across wing, tending to be produced along inner margin towards base; first costal streak beyond ¼, very oblique; second in middle, rather less oblique, not reaching half across wing, apex silvery-metallic; third before ¾, less oblique, ending in a violet-silvery metallic spot on disc; between second and third is sometimes an additional small white spot on costa; fourth, fifth, and sixth acutely wedge-shaped, small, hardly oblique, close together before apex; a violet-silvery metallic outwardly oblique streak from anal angle, ending in a spot between extremities of second and third costal streaks; an obscure violet-silvery metallic spot on hind-margin below middle; cilia white on tips, with a black hook at apex, basal ¾ separated by a blackish line and dark fuscous-grey, except a white dark-margined wedge-shaped indentation below apex, meeting a few silvery scales on hind margin. Hind-wings and cilia dark fuscous-grey.

Belonging to the group of *G. fischeriella*, *G. schœnicolella*, and the allied species, but distinguished from them all by the presence of an additional costal streak, nearer to the base than the dorsal streak; its nearest allies in Australia are the two following, which however do not possess the dorsal streak from middle of inner margin at all. Three ♂'s, taken at Sydney and Parramatta in dry places amongst low-growing *Carex*, in October and November.

Glyph. palæomorpha, *n. sp.*

♂ ♀. 3½″-3¾″. Head and thorax deep bronze. Palpi bronzy at base, second joint with two whorls of black white-tipped scales, terminal joint black with two oblique white bands. Antennæ dark fuscous. Abdomen dark fuscous, in ♀ elongate, in ♂ whitish at apex. Legs obscure fuscous, tarsi with slender whitish rings at apex of joints. Fore-wings narrow, somewhat dilated, hind-margin sinuate beneath apex; rather dark bronze, with five costal silvery-white streaks, and one dorsal silvery-metallic; first costal in middle, oblique, reaching half across wing; second before ¾, equally oblique, becoming silvery-metallic at apex, uniting with the outwardly oblique silvery-metallic dorsal streak from just before anal angle to form an angulated transverse fascia; third, fourth, and fifth, short, clo together before apex; an elongate silvery-metallic spot on hind margin below middle; a round black apical spot, beneath whic are some silvery-metallic scales; cilia whitish, dark fuscous anal angle, and with a black apical hook, basal half separat by a black line and dark fuscous, except a wedge-shaped whi indentation below apex, whence proceeds a strong black su apical hook. Hind-winds and cilia dark fuscous.

Distinguished from the group of *G. fischeriella*, to which approximates, by the absence of the dorsal streak from midd of inner margin, in which and other respects it is closely allied to *G. iocheæra*, but differs in the dark bronzy ground colour, and the clearer and more silvery streaks. Three specimens taken at Brisbane, and on damp goound on the forest-clad ascent of the Bulli Pass, at rest on the heads of a species of *Juncus*, in September and October.

Glyph. iochesœra, *n. sp.*

♂ ♀. 4″-4¾″. Head and thorax dark bronzy-grey. Palpi whitish at base, second joint with two appressed whorls of fuscous whitish-tipped scales, terminal joint dark fuscous with two white rings. Antennæ dark fuscous. Abdomen elongate, dark fuscous. Legs ochreous-grey, tarsal joints basally slightly suffused with darker. Fore-wings narrow, hardly dilated, hind-margin sinuate beneath apex; dull grey, slightly tinged with bronze; one dorsal and five costal slender rather obscure white streaks, anteriorly margined with dark fuscous-grey; first costal in middle, second from before ¾, both very oblique, not reaching half across wing; dorsal from just before anal angle, very oblique, apex almost reaching extremity of second costal; third, fourth, and fifth costal streaks acutely wedge-shaped, short, almost wholly on costal cilia; a silvery-white metallic spot on middle of hind-margin; a clear round black apical spot; cilia whitish, towards anal angle dark fuscous-grey, with a strong sharp black apical hook, and with basal half separated by a black line and dark fuscous-grey, except on a whitish wedge-shaped indentation below apex, whence proceeds a sharp black sub-apical hook. Hind-wings and cilia dark fuscous-grey.

Closely allied to the preceding species, but rather larger and narrower-winged, ground colour grey only slightly tinged with bronzy, costal and dorsal streaks not silvery. Four specimens taken on rushes (*Juncus*) in swampy places in January, at Dunedin and Christchurch, New Zealand.

Glyph. acrothecta, *n. sp.*

♂. 4½‴-5‴. Head and thorax dark bronzy-grey. white at base, second joint with two short oblique who black white-tipped scales, terminal joint black with two ob white rings and white above towards apex. Antennæ fuscous. Abdomen elongate, blackish-grey with white apex white. Legs dark fuscous, posterior and middle tibiæ white central and apical bands, tarsi with obsolete whitish at apex of joints, posterior tarsi with a clear white ring at of basal joint, and two apical joints wholly white. Fore- narrow, elongate, not dilated, hind-margin sinuate beneath dull pale grey, suffused with brownish on disc and inner ma six rather obscure white, anteriorly blackish-margined, ol costal streaks; first at ¼, reaching to middle, partially margined posteriorly as well; second in middle, not rea half across wing; third to sixth short, mostly on costal each silvery-metallic at apex; a black oblique streak from of inner margin, leading to an obscure whitish anteriorly margined spot below apex of first costal streak; a faint w spot on anal angle, preceded by a short curved black st two silvery-metallic spots on disc, beneath extremities of and third costal streaks, sometimes united with them; a large conical silvery-metallic black-margined spot on hind-m below middle; a small silvery-metallic black-margined s hind-margin below apex; cilia whitish, with a sharp apical hook, fuscous-grey towards anal angle, basal half sepa by a black line and fuscous-grey, except where a whitish margined indentation meets the small silvery-metallic sub- spot. Hind-wings and cilia dark fuscous-grey.

Not nearly allied to any described species; the markings a peculiar confused appearance; the black dorsal streak centre of inner margin is caused by the suffusion disappearance of the accompanying white streak. Six taken on the dry grassy volcanic hills near Christchurch, New Zealand, in January.

Glyph. astrapæa, *n. sp.*

♂. 5¼". Head and thorax brilliant metallic coppery bronze, face dark fuscus. Palpi with second joint clothed with three whorls of black very narrowly white-tipped scales, terminal joint black with an oblique white lateral line. Antennæ dark fuscous. Abdomen blackish-fuscous, apex ochreous-white. Legs dark bronzy-fuscous, middle and posterior tibiæ with obscure slender whitish central and apical rings, tarsi with obscure white rings at apex of joints, two apical joints of posterior tarsi wholly white. Fore-wings moderately broad, somewhat dilated, hind-margin sinuate below apex; brilliant metallic coppery-bronze, with violet-silvery metallic obscurely dark-margined markings; a short oblique streak from costa before middle; a rather irregular outwardly curved fascia from beyond middle of costa to anal angle; a rather short oblique streak from ¾ of costa, opposite extremity of which is a triangular spot on hind-margin below middle; two small spots on costa before apex, second produced as a curved streak to hind-margin below apex; cilia whitish towards apex, blackish-fuscous towards anal angle, with a black apical hook, and intersected by a strong black line, obliterated at anal angle and where a white black-margined indentation meets the sub-apical streak. Hind-wings and cilia blackish-fuscous.

This and the succeeding species are very handsome insects, not coming very near any others, but very closely allied together; *G. astrapæa* is distinguished by the total absence of the longitudinal streak from base, and by the complete fascia beyond middle; in other respects it is extremely similar. One ♂ taken flying in the sun in a grassy swamp near Cambridge, New Zealand, in January.

Glyph. transversella, *Wkr.*, Brit. Mus. Cat., 849 (Argyresthi

♂ ♀. 5½''-6''. Head and thorax brilliant metallic-bro face dark fuscous. Palpi yellowish at base, second joint three whorls of black white-tipped scales, terminal joint b with a white lateral line. Antennæ dark fuscous. Abdo in ♂ dark bronzy-fuscous, beneath silvery-white, in ♀ black apex whitish. Legs dark bronzy-fuscous, tarsi with wh rings at apex of joints, posterior tibiæ with white central apical rings, posterior tarsi with two apical joints wholly w Fore-wings moderately broad, somewhat dilated, hind-ma sinuate below apex; brilliant metallic coppery-bronze, golden-silvery metallic obscurely dark-margined markings; indistinct paler bronzy-yellowish central longitudinal streak base to beyond middle, broadest posteriorly, attenuated at b a short oblique streak from costa before middle; an obl streak from costa beyond middle, and a rather oblique st from anal angle, which are not united, apex of dorsal st lying beyond apex of costal; a rather short oblique streak ¾ of costa, opposite the extremity of which is a triangular on hind-margin below middle; two small spots on costa b apex, second produced as a curved streak to hind-margin b apex; cilia whitish towards apex, dark fuscous towards angle, with a black apical hook, basal half, except towards angle, separated by a black line and clothed with bronzy sc except where a white black-margined indentation meets the apical streak. Hind-wings and cilia blackish-fuscous.

Very nearly allied to *G. astrapæa*, but slightly less brill and characterised by the paler central streak from base, an costal and dorsal streaks beyond middle not being united i fascia. Eight specimens taken flying gently in the shade o damp grassy sheltered bank near Auckland, New Zealan January.

APISTOMORPHA, *n. g.*

Head smooth; with ocelli; tongue moderate. Antennæ much shorter than fore-wings, slender, filiform. No maxillary palpi. Labial palpi rather short, thick, arched; second joint beneath with a loose rather long tuft of projecting hairs, terminal joint loosely scaled, slender, pointed. Fore-wings elongate, hind-margin oblique, sinuate beneath apex, apex rounded, produced. Hind-wings ovate-lanceolate, rather pointed, narrower than fore-wings, cilia as broad as hind-wings. Abdomen rather elongate. Legs rather short, smoothly scaled. Fore-wings with 12 veins; secondary cell indicated; 7 and 8 stalked, one to each side of apex; 1 very shortly furcate at base. Hind-wings with 8 veins; 3 and 4 from posterior angle of cell.

Closely allied to *Glyphipteryx*, and in superficial appearance extremely similar, but characterised clearly by the stalking of veins 7 and 8 of forewings, and the tuft on second joint of palpi; in the latter character it resembles *Phryganostola*, but differs in the venation.

The habits of the imago are similar to those of *Glyphipteryx;* it has the same motion of fanning its wings when at rest. The larva is yet unknown.

Apist. argyrosema, *n. sp.*

♂ ♀. 3¼‴-4½‴. Head and thorax dark fuscous. Palpi white at base, second joint with two whorls of black white-tipped scales, produced beneath to form a rough tuft of black and white hairs; terminal joint black, clothed except extreme apex with two whorls of black white-tipped hairs. Antennæ dark fuscous. Abdomen dark fuscous, with silvery-whitish rings. Legs dark fuscous, all tarsi with slender white rings at apex of joints, posterior tibiæ with white central and apical bands, posterior tarsi with two apical joints wholly white. Fore-wings rather short, rather narrow, hind-margin distinctly sinuate; dark golden-bronze, with transverse golden-ochreous strigulæ; a white transverse spot on inner margin near base; a straight silvery-metallic streak from costa before ⅓, reaching to fold; two straight parallel silvery-metallic transverse fasciæ, first from middle of costa, second from ⅔ to anal angle, sometimes shortly interrupted below middle; two small silvery-metallic spots on costa at ¾, and a little before apex, becoming white in costal cilia; beneath the anterior one is a small discal silvery spot; a sub-apical silvery-metallic streak from costa to hind-margin little below apex; a triangular black patch on hind-margin above anal angle; its base resting on lower part of second fascia, its apex on middle of hind-margin, containing five or six irregular golden-metallic spots; above this patch are sometimes one or two longitudinal black lines on disc; cilia whitish, grey at apex and anal angle, basal half separated by a dark fuscous line and clothed with golden-ochreous scales, except where white indentation meets the sub-apical silvery streak. Hind-wings and cilia dark fuscous.

A handsome species, bearing considerable resemblance in markings to *Glyph. iometalla* and *Glyph. triselena;* being distinguished from the former by its larger size and the second complete fascia, from the latter by its darker colouring and broader irregularly-spotted anal patch. Rather common, occurring round Sydney and Parramatta, and at Bowenfels and Tarana on the Blue Mountains, about 2,500 feet above the sea; it flies in the sunshine towards sunset over dry grassy banks, in September, November, and from January to March, so that there is probably a succession of broods.

PHRYGANOSTOLA, *n. g.*

Head smooth; with ocelli; tongue moderate. Antennæ about half as long as fore-wings, filiform, in ♂ very shortly ciliated. No maxillary palpi. Labial palpi rather short, thick, arched; second joint clothed with long loose projecting hairs beneath, forming a broad tuft; terminal joint short, acute. Fore-wings elongate, variable in breadth, apex produced, hind-margin indented, very oblique. Hind-wings lanceolate or ovate-lanceolate, narrower than fore-wings, pointed, cilia about as broad. Abdomen elongate, slender. Legs moderate, smoothly scaled. Fore-wings with 12 separate veins; secondary cell indicated; 1 simple or furcate at base. Hind-wings with 8 veins; 3 and 4 from posterior angle of cell.

Nearly allied to *Glyphipteryx*, but differing in the long tuft on second joint of palpi; from *Apistomorpha* it is distinguished by veins 7 and 8 of fore-wings not being stalked. The fore-wings and abdomen are mostly more elongate than in either of these genera. The imagos have the same habit of fanning themselves when at rest, but frequent the shade rather than the sunshine, and are less brilliantly marked. The larvæ are at present unknown. The four species described here may be known from one another by the following characteristics :—

1. Fore-wings with scattered silvery-metallic spots	drosophaës
2. Fore-wings with central longitudinal white streak from base..	euthybelemna
3. Fore-wings with white streak from base along inner margin	oxymachæra
4. Fore-wings unicolorous pale grey ..	achlyoëssa

Phryg. drosophaës, *n. sp.*

♂. 6″. Head and thorax dull bronzy-grey. Palpi ochreous-white at base, second joint with a long rough tuft of mixed black and white hairs, terminal joint slender, black, with two white rings. Antennæ dark fuscous. Abdomen dark fuscous, apex whitish. Legs dark fuscous, tarsi with white rings at apex of joints, posterior tibiæ dull grey, apex white. Fore-wings rather broad, dilated, dull fuscous-grey, with fine

transverse ochreous strigulæ, and silvery-metallic coarsely b
margined markings; five short rather oblique costal str
first before, second beyond middle; a spot on inner m
beyond middle, and a short rather oblique streak from
angle; three spots on hind-margin, respectively below midd
middle, and below apex; five spots on disc, first two form
curve with second costal and first dorsal streak, second
forming a parallel curve with third costal and streak from
angle, fifth beneath apex of fourth costal streak; a small sil
metallic spot in apex; cilia whitish, with a black apical l
basal half separated by a black line, and dark purple-fus
except where a white black-margined indentation meets
sub-apical silvery spot. Hind-wings and cilia dark fuscous-

This is the broadest winged species of the genus. It ap
to be a shade-loving insect; two ♂'s taken in a deep
beneath damp overhanging rocks near Parramatta, in Octo

Phryg. euthybelemna, *n. sp.*

♂. 5½″. Head and thorax light bronzy grey. Pal
ochreous, second joint beneath with a rather long rough pro
fringe of white hairs. Antennæ dark fuscous. Al
ochreous-grey, apex whitish-ochreous. Legs fuscous-gre
with whitish rings at apex of joints, posterior tib
whitish central and apical rings. Fore-wings moderate
dilated, pale ochreous-bronze, with pure white fuscous-
markings; a rather broad central longitudinal streak
to ⅔; a small spot on costa about ¼, slenderly produ
costa towards base; a short oblique streak from c
middle, followed by a small obscure costal spot; a lon
streak from middle of costa, and a rather oblique
anal angle, their extremities meeting in a silvery-
on apex of basal streak; the apical half of cost
seven short rather oblique white streaks, separated
dark fuscous margins; an irregular silvery-metall

lower part of hind-margin, black-margined anteriorly; apex blackish, with some silvery-white scales; cilia white, with a blackish apical hook, towards anal angle fuscous-grey, basal half separated by a black line and fuscous-grey, except where a white black-margined indentation meets hind-margin below apex. Hind-wings fuscous-grey, cilia rather paler.

An elegantly-marked species, conspicuous through the central basal streak. Several ♂'s taken by Mr. G. H. Raynor at Melbourne, and also at Brighton in Tasmania, in January.

Phryg. oxymachæra, *n. sp.*

♂♀. 4¾"-5¾". Head whitish. Thorax whitish, sometimes suffused with fuscous. Palpi white, second joint with two fuscous-grey rings, beneath with a long loose projecting tuft of white hairs, mixed with a few fuscous-grey. Antennæ dark fuscous. Abdomen very elongate, especially in ♀, varying from pale ochreous to dark fuscous-grey; with whitish rings. Legs fuscous-grey or ochreous-grey, posterior tibiæ white at apex, all tarsi fuscous or dark fuscous with white rings at apex of joints. Fore-wings elongate, narrow, hardly dilated, dull fuscous, sometimes suffused with whitish along costa, with white dark-margined markings; a broad streak along inner margin from base to beyond middle, thence attenuated and directed obliquely upwards, ending on middle of disc at ⅔ from base; eight rather short oblique costal streaks, none reaching half across wing, first at ¼, produced along costa towards base, all sometimes rendered obsolete by a general white suffusion of the costa; a rather short oblique streak from anal angle, ending in a bright silvery-metallic spot on disc; a small silvery-metallic spot on hind-margin below middle; cilia white, with a black apical hook, and intersected by a strong black line, except where a white black-margined indentation meets hind-margin beneath apex. Hind-wings fuscous-grey, cilia whitish.

Remarkable from its lanceolate wings and very elo abdomen; it varies rather considerably in depth of colou Six specimens taken on the dry grassy volcanic hills Christchurch, New Zealand, in January.

Phryg. achlyoëssa, *n. sp.*

♂. 5½″. Head and thorax whitish-grey. Palpi wh grey, mixed with dark fuscous, second joint beneath with a loose prejecting fringe of hairs. Antennæ dark fus Abdomen elongate, dark fuscous. Legs pale ochreous- Fore-wings elongate, narrow, hind-margin strongly sinuate b apex; pale whitish-grey, faintly strigulated transversely darker; a few solitary black scales, tending to be arra longitudinally on fold and lower median vein; cilia whitish, an obscure dark fuscous apical hook, basal ⅓ separated blackish line and dark smoky-grey. Hind-wings and fuscous-grey.

An inconspicuous narrow-winged almost unicolorous sp One ♂ taken flying at dusk on a bare grassy hill Wellington, New Zealand, in January.

ERECHTHIADÆ.

I have at present five genera of this family, which m thus tabulated:—

A. Face smooth .. .. Hippiochæ
B. Face rough-haired.
  I. Fore-wings with 12 veins .. .. Eschatotyp
  II. Fore-wings with 11 veins.
    a. Veins 6 and 7 of fore-wings stalked Ereunetis
    b. Veins 6 and 7 of fore-wings separate.
      1. Veins 5 & 6 of hind-wings stalked Erechthias
      2. Veins 5 & 6 of hind-wings separate Comodica

HIPPIOCHÆTES, *n. g.*

Head roughly tufted above, face smooth; ocelli (?); no tongue. Antennæ shorter than forewings, in ♂ thickened, finely ciliated. Maxillary palpi rather short, folded. Labial palpi short, slender, drooping. Fore-wings elongate, rather narrow, hind-margin very obliquely rounded. Hind-wings lanceolate, narrower than fore-wings, cilia nearly twice as broad. Abdomen moderate. Legs rather short, slender, posterior tibiæ and first joint of tarsi clothed beneath with rather long dense hairs. Fore-wings with (apparently) 11 separate veins. Hind-wings with 8 veins; 5 and 6 stalked; one to each side of apex.

This genus, containing at present only a single species, is very remarkable, affording a clear connecting link between the *Glyphipterygidæ* and *Erechthiadæ*. It differs from the rest of the *Erechthiadæ* in the smooth face, and in superficial marking, and I have not been able to properly examine the neuration of the single specimen; but the roughly-tufted crown prevents its association with the *Glyphipterygidæ*, and its reference to the *Erechthiadæ* is clearly determined by the absence of a tongue, the development of the maxillary palpi, and the short drooping labial palpi, as well as by what can be made out of the neuration. Its habits are at present unknown.

Hipp. chrysaspis, *n. sp.*

♂. 3¾″. Head dark ochreous mixed with fuscous on crown, face dark fuscous mixed with ferruginous. Palpi pale whitish-grey. Antennæ dark fuscous. Thorax and abdomen blackish-fuscous. Legs black above, shining ochreous-white beneath. Fore-wings blackish-fuscous; a large acute-triangular yellow oblique spot on inner margin at base, its base extending from middle of base of wing to ¼ of inner margin and including a roundish black spot, its apex resting on disc just before middle; a rather smaller oblique triangular yellow spot on inner margin before anal angle, bisected by a blackish line from its apex to its base, its base broad, its apex reaching half across wing beyond middle of disc, its anterior side parallel to the posterior side of first spot; a very oblique white streak from middle of costa to above apex of second dorsal spot; a second much less oblique white streak from costa before ¾, reaching ⅔ across wing; between its apex and that of second dorsal spot is a silvery-metallic spot near hind-margin; an oblique white sub-apical streak from costa; a silvery-metallic line along lower part of hind-margin; cilia white at tips, basal ⅔ dark fuscous-grey, round apex (apparently) silvery-white with a black intersecting line. Hind-wings and cilia dark fuscous.

This is a beautiful and singular insect, not closely resembling any other known. I have but one specimen, of which the apical cilia are a little injured, but otherwise very perfect; taken at rest on a fence in Sydney, in November.

COMODICA, *n. g.*

Head rough all over, tufted between eyes; with ocelli; no tongue. Antennæ shorter than fore-wings, in ♂ thickened, basal joint large, broadly compressed. Maxillary palpi moderate, folded. Labial palpi moderate, porrected, rather slender, with appressed scales; terminal joint much shorter than second, bluntly pointed. Fore-wings elongate, rather narrow, tolerably evenly pointed. Hind-wings lanceolate, hardly narrower than fore-wings, apex rather produced, very acute, cilia rather broader. Abdomen elongate. Legs moderate, posterior tibiæ clothed with long hairs. Fore-wings with 11 separate veins, sub-costal obsolete towards base; secondary cell indicated; 1 simple. Hind-wings with 8 separate veins, sub-costal obsolete before middle, 6 running to apex.

The genus is readily recognised by the neuration, especially by the separation of veins 5 and 6 of hindwings, the sharp rather produced apex of hind-wings, and the double apical hook of fore-wings. In repose the imago sits closely appressed to the surface, the double apical hook on the fore-wings being turned up, so as to present the semblance of four short erect tails round the posterior extremity of the insect. I have only one species, of which the larva is unknown.

Com. tetracercella, *n. sp.*

♂ ♀. 4" 5". Head whitish-ochreous, with a blackish-fuscous spot between antennæ. Palpi whitish-ochreous. Antennæ in ♂ dark fuscous above, whitish-ochreous towards base, in ♀ wholly whitish-ochreous. Thorax pale ochreous, with an irregular blackish central spot. Abdomen dark ochreous-grey, apex pale ochreous. Legs ochreous-whitish, anterior tibiæ suffused with dark fuscous, middle tibiæ with slender oblique dark fuscous central and apical bands, all tarsi suffused with dark fuscous at base of joints. Fore-wings ochreous-white or cream colour, sometimes partially suffused with ochreous; five oblique streaks from costa and five from inner margin blackish, suffused with ochreous, of variable intensity; a minute blackish spot on costa at base, sometimes obsolete, and a rather larger one on inner margin at base; first costal streak near base, generally very short, sometimes suffusedly produced very obliquely to apex of second; second at ⅓, sometimes broad, very oblique, reaching half across wing; third from middle of costa, broadest of all, very oblique, not reaching half across wing; fourth a little beyond it, slender, bent at apex to meet extremity of third; fifth close before apex, very oblique, consisting of a few black scales preceded by a rather broad ochreous streak; first dorsal streak oblique, close to base, reaching middle; second at ¼, equally oblique, apex produced to meet extremity of second costal; third broad, in middle, fourth just beyond it, both often confluent and blotch-like, reaching half across wing, where their apices are often produced as slender longitudinal lines; fifth irregular, spot-like, on anal angle; a strong black apical streak, extending obliquely downwards from apex to disc below extremities of third and fourth costal streaks; cilia ochreous-white, becoming grey at anal angle, containing a clear black spot directly above apex, and another more obscure directly below it, and with two straight thick black lines projecting from apex, the one rather obliquely upwards, the other rather obliquely downwards, beneath the lower of which the cilia are excavated to base by a curved wedge-shaped indentation. Hind-wings and cilia fuscous-grey.

The sharp erected apical hooks give this insect a singular appearance in repose. It has a peculiar streaked and variegated ornamentation, and does not nearly resemble any other. Common at Sydney on fences from November to January; also taken at Brisbane in the open bush in September.

ESCHATOTYPA, *n. g.*

Head rough all over, tufted between eyes; with ocelli; no tongue. Antennæ shorter than fore-wings, in ♂ somewhat thickened, basal joint slightly broader. Maxillary palpi long, folded. Labial palpi moderately long, porrected; second joint with a few bristles above, and clothed beneath with short projecting hairs, especially at apex; terminal joint much shorter than second, bluntly pointed, loosely scaled. Fore-wings elongate, somewhat dilated, hind-margin very obliquely rounded. Hind-wings ovate-lanceolate, rather narrower than fore-wings, cilia narrower. Abdomen rather elongate. Legs moderate, posterior tibiæ smoothly scaled, beneath fringed with long hairs. Fore-wings with 12 separate veins; 5 branches to hind-margin; sub-costal obsolete towards base; secondary cell indicated; 1 furcate at base. Hind-wings with 8 veins, sub-costal obsolete before middle; 5 and 6 stalked, 6 running to hind-margin.

This genus differs from all the rest of the family in possessing 12 veins (all separate) in the fore-wings, and is proportionately somewhat broader winged. In repose the apex of the fore-wings is somewhat turned up, but not very conspicuously.

Esch. melichrysa, *n. sp.*

♂ ♀. 4‴-6‴. Head snow-white. Palpi white, fringe of second joint mixed with dark fuscous-grey. Antennæ whitish-ochreous, basal joint white. Thorax white, irregularly suffused on margins with greyish-ochreous. Abdomen dark ochreous-grey. Legs pale greyish-ochreous, tarsi suffused with darker grey at base of joints. Fore-wings white, with irregular and partially suffused greyish-ochreous or yellow-ochreous markings; an oblique rather narrow dark-margined band from $\frac{1}{3}$ of costa, meeting an obsolete similar band from $\frac{1}{3}$ of inner margin on disc, to form an angulated fascia of which the lower half is indistinct; before this are several irregular strigulæ on costa and inner margin; a similar dark-margined angulated rather broader fascia from $\frac{2}{3}$ of costa to about $\frac{2}{3}$ of inner margin, often furcate on costa (in one specimen obsoletely double throughout), most indistinct on disc; between the two fasciæ are faint greyish-ochreous clouds on disc, and sometimes indistinct fuscous-grey strigulæ on costa; apical portion of wing greyish-ochreous or ochreous, separated from second fascia by a narrow white fascia, and connected with it by an oblique greyish-ochreous dark-margined irregular band below middle; in the apical portion are two small white irregular spots on costa close before apex, a small blackish apical dot, white-margined above and below, a small white black-margined spot on hind-margin beneath apex, and some irregular confused white black-margined spots on lower part of hind-margin and on disc; all the markings are variable in shape and intensity of colouring; cilia yellowish-ochreous, with a dark grey dividing line, and a white spot below apex. Hind-wings and cilia pale slaty-grey.

A rather elegantly marked insect, but variable in size and colouring; my southern specimens are the largest and brightest. Rather common at Wellington and Dunedin, New Zealand, in December and January, beaten from forest growth; its habits are sluggish.

EREUNETIS, *n. g.*

Head rough all over, tufted between eyes; with o
tongue. Antennæ shorter than forewings, in ♂ s
thickened, basal joint broadly compressed. Maxilla
moderate, folded. Labial palpi moderately long, p
second joint beneath with a more or less long and dens
of hairs; terminal joint shorter, bluntly pointed, so
concealed in hairs of second joint. Fore-wings elongat
narrow, tolerably evenly pointed. Hind-wings lanceolat
narrower than fore-wings, cilia rather broader. A
elongate. Legs moderate, posterior tibiæ beneath or
clothed with long hairs. Fore-wings with 11 veins; s
obsolete towards base; secondary cell indicated; 6 and 7
both to costa; 1 simple. Hind-wings with 8 or 7 veins
being sometimes obsolete); sub-costal obsolete before m
and 6 stalked, one to either side of apex.

Distinguished from all the other genera by the sta
veins 6 and 7 of fore-wings; from *Erechthias*, to which
nearest, also by vein 1 of fore-wings not being furcate
In one species the hind-wings (? in ♂ only) possess a
thickened patch of scales on disc near base, and in a
transparent hyaline spot in the same place. The spe
rather retired and sluggish in habit; the only larva
appears to feed in the bark of trees. There are three
known to me, distinguished as follows:—

A. Hind-wings with a transparent patch at base .. .. 3. iulop
B. Hind-wings without a transparent patch at base.
  1. Fore-wings with faint ochreous-yellow bands .. .. 1. selen
  2. Fore-wings with dark fuscous and ochreous markings .. .. 2. bront

Ereun. selenophanes, *n. sp.*

♂. 3¾″-4″. Head snow-white. Antennæ white, slenderly annulated with dark fuscous, and with a broader blackish band in middle, and four other black rings towards apex. Palpi snow-white, second joint of labial palpi with a short fringe. Thorax white, suffused with pale yellowish on sides. Abdomen ochreous-grey, beneath whitish-ochreous. Legs ochreous-whitish, tarsi suffused with darker grey at base of joints. Fore-wings whitish, faintly suffused with ochreous-yellowish, and with three rather darker faint ochreous-yellow transverse bands; first band near base, rather curved, margined on costa with two blackish spots; second at ⅓; irregular, angulated outwards above middle, margined on costa with two very short blackish streaks; third much broader, from about ⅔ of costa very obliquely outwards nearly to hind-margin, thence angulated very sharply and continued more obscurely, and parallel to hind-margin, to inner margin before anal angle, margined on costa with two very short blackish streaks; a longitudinal linear black apical spot; a faint grey line on hind-margin, becoming blackish round apex; cilia pale ochreous-yellow, with a cloudy whitish spot beneath apex. Hind-wings and cilia rather pale fuscous-grey.

A faintly-marked species, most nearly resembling *Ereum. isoloptera*, but smaller, without the transparent spot of hind-wings, and the markings differently arranged. Four ♂'s taken in the dry barren scrub above the Bulli Pass, and also at Brisbane, in September and October.

Ereun. brontoctypa, *n. sp.*

♂. 3¼″-3¾″. Head and palpi white, second joint of labial palpi dark fuscous beneath, with a short fringe. Antennæ swollen above basal joint, white, slenderly annulated with dark fuscous, with three broader blackish bands towards apex, and sometimes one above base. Thorax ochreous-whitish, anterior margin dark fuscous. Abdomen dark grey. Legs ochreous-

grey, tibiæ darker grey. Fore-wings dull whitish, with
and dark fuscous markings ; a small oblique cloudy dar
blotch on costa before ¼, and a rather larger obliq
fuscous blotch from costa slightly before middle, re
across wing; between second blotch and base the
slenderly dark fuscous; a much broader oblique dark
costa above ⅔, suffusedly truncate and reaching only
wing; two or three small irregular blackish-fuscous
inner margin near base; a cloudy dull ochreous stre
fold, extending to anal angle where it is expanded into
ochreous blotch, partially uniting with third costal blotc
margin irregularly dark fuscous; a small linear blacki
spot; cilia whitish-ochreous, towards anal angle grey
with a darker dividing line. Hind-wings and cilia ra
fuscous-grey, with a roundish black thickened spot
scales (in ♂ only ?) in disc close to base, visible on both
on lower surface forming a raised hooked projection.

Distinguished from both its congeners by the clo
fuscous markings; it has somewhat the superficial ap
of a *Bucculatrix*. Three ♂'s taken amongst dry scrub
and Brisbane, in September, October, and April.

Ereun. iuloptera, *n. sp.*

♂ ♀. 4″-5″. Head and palpi white, labial palpi
clothed with dense rough hairs, on sides mixed with
fuscous. Antennæ ochreous-whitish, slenderly annul
black. Thorax white, anteriorly suffused with
Abdomen elongate, whitish-ochreous. Legs whitish-
anterior tibiæ dark fuscous, middle tibiæ with dark
central and apical rings, all tarsi with dark fuscous rin
of joints. Fore-wings whitish, irrorated and irregularl
with pale ochreous, with indistinct cloudy ochreous ma
roundish spot at base of costa; an oblique fascia-like

with blackish near inner margin; an oblique fascia-like spot from costa just before middle, reaching half across wing; an irregular spot on anal angle; a rather larger irregular suffused spot on costa about ¾; a roundish dark fuscous apical spot; costa throughout tending to be irregularly strigulated with short blackish marks, sometimes obsolete; cilia white, round apex ochreous, with tips and an irregular dividing-line dark fuscous. Hind-wings grey, with an elongate-ovate transparent patch on disc at base, beneath lower median vein; cilia whitish.

Larger than either of the two preceding, remarkable from its densely haired palpi, and the hyaline patch on hind-wings. When at rest the tips of the fore-wings are bent up very strongly, more so than in the allied species. Common at Sydney at rest on fences, from November to January, and again in May.

I have bred this species from a pupa found in the bark of a fibrous-barked species of Eucalyptus, between the layers; although I have not observed the larva, I have little doubt that it had fed in that situation. Pupa elongate, slender, pale amber, antennal sheaths separate; enclosed in a cocoon of firm silk covered with refuse; found in November.

ERECHTHIAS, *n. g.*

Head rough all over, tufted between eyes; with ocelli; no tongue. Antennæ shorter than fore-wings, in ♂ somewhat thickened, basal joint rather broader. Maxillary palpi rather short, folded. Labial palpi moderately long, porrected, second joint with from a few bristles to a dense fringe of hairs beneath; terminal joint shorter, bluntly pointed, sometimes also fringed beneath with hairs. Fore-wings elongate, rather narrow, tolerably evenly pointed. Hind-wings lanceolate, about as broad as fore-wings, cilia about as broad. Abdomen elongate. Legs moderate, posterior tibiæ clothed with long fine hairs. Fore-wings with 11 veins, sub-costal obsolete towards base; secondary cell indicated; 4 and 5 sometimes approximated on hind-margin; 1 furcate at base, but lower sometimes partially obsolete. Hind-wings with 8 veins, sub-costal obsolete before middle; 5 and 6 stalked, one to either side of apex.

This genus appears to be of some extent; it is subject to variation with regard to the scaling of the labial palpi, which are sometimes densely rough-haired, but the gradations do not admit of further division. The neuration throughout the genus is uniform; vein 1 of fore-wings is always furcate at some distance from base, but the lower branch is sometimes only distinct at its origin. The width of the fore-wings also varies The habits of the imago are retired and sluggish; in repose they sit flatly appressed to the surface, with the apex of the fore-wings bent upwards. Though not brightly coloured, they are elegantly marked.

The larva of one species only is known to me; it is 16-legged, without peculiarity, and feeds in the seed-heads of one of the *Liliaceæ;* the pupa is placed in a slight cocoon amongst refuse in the seed-head.

I have ten species of this genus, which may be thus tabularly arranged:—

A. Fore-wings ochreous.
  1. Fore-wings with dark fuscous streaks along margins .. .. ..6 charadrota
  2. Fore-wings without dark fuscous streaks along margins.
    a. Face white.. .. .. ..4 acontistes
    b. Face orange-ochreous .. ..5 elæorrhoa

B. Fore-wings white, with dark fuscous markings.
  1. Labial palpi beneath with long dense fringe .. ..1 mystacinella
  2. Labial palpi loosely haired, hardly rough.

a. With a central longitudinal streak from base to apex .. .. 3 stilbella
b. With a streak along inner margin from base to middle .. .. 2 chasmatias
c. With a band along inner margin from base to apex .. .. 7 chionodira
C. Fore-wings grey, with white markings ..10 aëllophora
D. Fore-wings dark fuscous with white markings.
1. Central streak from base broad, extending to hind-margin .. 8 subpavonella
2. Central streak from base narrow, not reaching middle .. .. .. 9 niphadopla

Erech. mystacinella, *Wkr.*, Brit. Mus. Cat. 1006 *(Tinea.)*

♂♀. 5‴-7‴. Head and palpi white, second joint of labial palpi with a dense long fringe beneath, more or less concealing terminal joint. Antennæ dark greyish-ochreous, slenderly annulated with whitish, with a slender black ring above white basal joint. Thorax white, anterior margin and two spots on back connected with it blackish. Abdomen whitish-ochreous. Legs white; anterior tibiæ and tarsi black above, middle tarsi with dark fuscous rings at base of joints. Fore-wings white, with a black white-sprinkled streak along inner margin from base almost to anal angle, narrow at first and partially interrupted near base, emitting two oblique teeth (the first fuscous) before and after ¼, which reach half across wing, and beyond middle dilated into a broad semi-ovate spot, reaching half across wing, containing a linear white indentation on its posterior edge; a small black spot on costa at base; a small blackish spot on disc above and between teeth of dorsal streak; four slender dark fuscous streaks from costa; first before, second beyond middle, short, very oblique; third at ¾, longer, very oblique, uniting at apex with fourth, which is almost apical and much less o extending through costal cilia, and followed by a whi beyond which is a round ochreous posteriorly black m spot in apical cilia, containing a crescent-shaped black hind-margin faintly clouded with grey; cilia white ex the apical ochreous spot, beyond which are two distinct b lines round apex only, and a strong short black hook pro directly from apical spot, being a prolongation of the crescent shaped mark. Hind-wings fuscous-grey, cilia w

A handsome species, variable in size, southern spe being the largest. It resembles the two following spe shape of wing, and general appearance, but is imme known by the broad toothed inner-marginal streak, as by the long dense hairs of the labial palpi. A commo widely distributed species, generally taken at rest on without any clue to its habits; it occurs at Sydne Parramatta, at Springwood on the Blue Mountains (1,200 also at Brisbane, Melbourne, and at Brighton in Tasmani October to March.

Erech. chasmatias, *n. sp.*

♂. 6½." Head white. Palpi white, second joint of palpi dark fuscous above, beneath with loose scales, te joint loosely haired. Antennæ whitish, obsoletely ann with darker. Thorax white, lateral and anterior margin fuscous. Abdomen ochreous-whitish. Legs whitish, a tibiæ and tarsi blackish above, middle tarsi with dark f rings at base of joints. Fore-wings white, with dark f markings; a broad streak along inner margin from b beyond middle, where it is attenuated and bent upwards, on disc beyond middle; a slender straight line from b costa through disc to apex, interrupted at ¾, beyond w becomes much broader, containing a black longitudinal and ending in a round black apical spot; a short very o blotch on costa beyond middle; a black streak along costa from about ¾ to apex; an elongate streak on hind-margin about anal angle, attenuated at both ends; cilia white, with two blackish dividing lines throughout, and indications of a projecting hook at apex. Hind-wings whitish-grey, cilia whitish, with two dark fuscous cloudy lines round apex.

At first sight very like the following species, but the markings are very differently arranged; probably other nearly allied species will be found. Two males taken at Wellington, New Zealand, amongst forest growth, in January.

Erech. stilbella, *Wkr.*, Brit. Mus. Cat. 849 *(Argyresthia).*

♂ ♀. 6‴-7‴. Head white, narrowly dark fuscous on sides and behind. Palpi white, labial palpi with second joint and base of terminal joint dark fuscous externally, second joint with loose scales beneath, terminal joint with loose rather long hairs. Antennæ dark fuscous. Thorax white, lateral margins broadly dark fuscous. Abdomen ochreous-whitish. Legs whitish, anterior tibiæ and tarsi dark fuscous above, middle tarsi with dark fuscous spots at base of joints. Fore-wings white, with dark fuscous markings; a rather broad straight central streak from base to apex; extreme costal edge blackish towards base; a slender partially indistinct straight line from base of costa through disc, coalescing with the central streak at ¾ of wing; a slender very oblique streak from costa beyond middle, also coalescing with central streak before apex; a slender streak along costa from ¾ to apex; a slender streak along hind-margin throughout; a round blackish apical spot in cilia; cilia white, with two dark fuscous dividing lines throughout towards tips, innermost indistinct. Hind-wings pale fuscous-grey, cilia whitish, with a blackish dividing line round apex.

Characterised by the strong central streak from base to apex. Three specimens taken amongst forest at Auckland and Wellington, New Zealand, in January.

Erech. acontistes, *n. sp.*

♂ ♀. 5½″-7¼″. Head white, sides of crown ochreous-fuscous. Palpi white, labial palpi with second joint and base of terminal joint externally ochreous-fuscous, both clothed with rather loosely appressed hairs, apex of second joint with two or three projecting bristles above. Antennæ dark ochreous-fuscous. Thorax dark ochreous-brown, with a central longitudinal white stripe. Abdomen greyish-ochreous. Legs whitish. anterior tibiæ and tarsi dark fuscous above, middle tarsi suffused with fuscous, posterior tarsi with dark fuscous rings at base of joints. Fore-wings brownish-ochreous, darkest towards costa; a white central longitudinal streak from base to ⅔ of disc, somewhat attenuated at both ends, lower edge straight and sharply margined by a cloudy streak of blackish scales which is continued to apex of wing; two very oblique white streaks from costa, first from middle, second from ¾, extending almost to hind-margin; between them is a small cloudy white spot on disc, often confluent with the second; a slender white streak along hind-margin from beneath apex to anal angle; a blackish suffused apical spot, above which is a white spot, and sometimes anteriorly white-margined; cilia white, with a blackish dividing-line before middle, the intercepted basal portion brownish-ochreous, and with another entire blackish dividing-line beyond middle, and two others beyond it only visible on middle of hind-margin; beyond the second dividing-line at apex is a sub-quadrate blackish spot, forming a short blunt hook, being margined beneath by a short wedge-shaped indentation in the cilia. Hind-wings pale fuscous grey, cilia whitish, with two indistinct blackish lines round apex.

Nearly allied to the following species, but easily known by the white head, and pale grey hind-wings; the markings are very similar, but clearer. Common at Blackheath on the Blue Mountains (3,600 feet), and also occurring on the Bulli Pass, and at Parramatta, in September and October, and again in

March; it is a very sluggish insect, and habitually remains at rest on or near its food plant.

Larva moderately elongate, cylindrical, slightly flattened; dirty greyish-white, dorsal vessel darker, slate-coloured; head brown; second segment dark brown. Feeds in the tall spear-like seed-heads of *Xanthorrhœa Australis (Liliaceæ)*, the so-called "grass-tree;" it burrows amongst the seeds, manifesting its presence by loosening them at their base and ejecting refuse; feeds in February and March, and in August. Pupa pale amber, in a slight cocoon amongst refuse in the head.

Erech. elæorrhoa, *n. sp.*

♂. 5½‴. Head bright orange-ochreous, with a narrow white longitudinal stripe on crown. Labial palpi bright orange-ochreous, beneath whitish, with loosely appressed hairs. Antennæ dark fuscous, annulated with whitish. Thorax orange-ochreous, obsoletely whitish in centre. Abdomen dark fuscous Legs ochreous-whitish, anterior and middle tibiæ and anterior tarsi suffused with dark fuscous above, middle and posterior tarsi suffused with dark fuscous at base of joints. Fore-wings bright orange-ochreous, suffused with white towards inner margin, and mixed with blackish along costa and hind-margin; a white central longitudinal streak from base to beyond ⅔, but posteriorly suffused, rather indistinct and not sharply marked; two very oblique indistinct white streaks from costa, first from middle, second from ¾, extending almost to hind-margin; some white scales on hind-margin mixed with the black; cilia dark fuscous, with a white apical spot, and indistinct blacker lines round apex. Hind-wings and cilia blackish-fuscous.

Bears a close general resemblance to *E. acontistes*, but rather smaller, brighter and more suffused, with orange-ochreous head and palpi, and blackish-fuscous hind-wings. One male only, taken at Parramatta in September, amongst dry scrub.

Erech. charadrota, *n. sp.*

♂ ♀. 5″-6½″. Head and palpi pale ochreous, face d ochreous; labial palpi externally dark fuscous, second roughly scaled beneath, with two or three projecting b above at apex. Antennæ pale ochreous, with obsolete d fuscous annulations. Thorax pale ochreous. Abdomen gr ochreous. Anterior and middle legs blackish, tarsi with sl pale ochreous rings at apex of joints; posterior legs wh ochreous, tarsi suffused at base of joints with dark fuscous. wings narrow, pale ochreous; a broad sharply marked och fuscous streak, suffused with blackish, along costa from b apex, narrowest at base and dilated beyond middle; a s more evenly broad streak along inner-margin from base t angle; in the costal streak are a very slender pale och oblique streak from middle of costa, and an irregular strea pale ochreous spot before apex; cilia whitish-ochreous, wi blackish dividing-lines, and a small apical hook-like spot b them. Hind-wings pale fuscous-grey, cilia whitish-grey two blackish lines round apex.

Not nearly resembling any of its congeners; it is the narr winged species of the genus. Three specimens taken am dry forest-scrub near Wellington and Port Lyttelton, Zealand, in January.

Erech. chionodira, *n. sp.*

♂ ♀. 4½″-5½″. Head white, sides of crown narrowly brow ochreous. Palpi white, second joint of labial palpi dark fu externally except at apex, both joints loosely haired. An whitish, with obsolete dark fuscous annulations. Thorax och browh, with a narrow white longitudinal central stripe. Abd whitish-ochreous. Legs white, anterior tibiæ and tarsi obs suffused with dark fuscous above, middle tarsi with dark fu rings at base of joints. Fore-wings glossy snow-white; a ochreous-brown streak along inner-margin from base to anal angle, posteriorly attenuated, containing some blackish scales on inner margin; this streak is margined above by a blackish streak, commencing at base as a slender line and dilating gradually to anal angle, where it is as broad as the inner-marginal streak in middle, thence continued along hind-margin to apex, its upper edge obtusely dilated about middle of hind-margin, produced into apical cilia as a short straight projecting bar; base of costa slenderly blackish; a small cloudy subcostal blackish spot before middle; two slender blackish oblique streaks from costa, first beyond middle, very short, nearly obsolete, second midway between first and apex, longer, its apex confluent with the hind-marginal streak; cilia whitish, with three broad cloudy blackish-fuscous lines. Hind-wings and cilia white, extreme apex and two obscure lines round it fuscous.

A very distinct and elegant species. Two specimens at Auckland New Zealand, amongst forest growth on a shady bank in January.

Erech. subpavonella, *Wkr.*, Brit. Mus. Cat. 898, *(Elachista)*.

♂. 5½‴. Head and palpi white, second joint of labial palpi fuscous externally, roughly scaled beneath. Antennæ ochreous-whitish, obsoletely annulated with darker. Thorax white, anterior margin sharply dark fuscous. Abdomen whitish-ochreous. Anterior legs blackish; middle and posterior legs whitish-ochreous, middle tibiæ suffused with fuscous above, middle tarsi with dark fuscous rings at base of joints. Fore-wings blackish-fuscous; a straight central longitudinal creamy-white streak from base to hind-margin below apex, becoming rather broader posteriorly, lower margin rather irregular; two oblique white streaks from costa, first from rather before middle, becoming confluent with central streak before its apex; second midway between first and apex, shorter and more suffused; cilia white, containing a blackish ovate apical spot, and with two black dividing-lines beyond it. Hind-wings pale fuscous-grey, cilia whitish.

This appears to be the species intended by Walker's description. From *E. niphadopla*, the only other species with dark fuscous ground-colour, it is distinguished by the white basal streak being extended to hind-margin, as well as by the considerably larger size. One male from forest at Auckland, New Zealand, in January.

Erech. niphadopla, *n. sp.*

♀. 3⅓″. Head white, sides of crown rather broadly blackish. Labial palpi blackish, terminal joint white at apex, second joint rather roughly scaled. Antennæ blackish, with indistinct whitish annulations. Thorax blackish-fuscous, with a narrow white central longitudinal stripe. Abdomen grey. Anterior legs blackish, middle and posterior legs glossy grey, apex of tarsal joints paler. Fore-wings blackish-fuscous; a rather narrow white central longitudinal streak from base to before middle; a slender white streak along inner-margin from base to anal angle, thence along hind-margin nearly to apex; two oblique moderately broad white costal streaks, first from about middle, second from ¾, each reaching about half across wing; cilia white, containing a roundish black apical spot, and three broad cloudy blackish-fuscous dividing-lines beyond it. Hind-wings rather pale fuscous-grey, darker posteriorly; cilia whitish-grey.

This is the smallest species of the genus, known by its black and white markings, and short basal streak. One female taken amongst dry scrub on the North Shore, Sydney, in December.

Erech. aëllophora, *n. sp.*

♂ ♀. 4″-4⅓″. Head white, slightly mixed with grey. Labial palpi with appressed scales, blackish-fuscous, internally silvery-white, apex of second joint with two or three projecting bristles above and below. Antennæ whitish, with obsolete dark fuscous annulations. Thorax white, anterior margin narrowly blackish-fuscous. Abdomen ochreous-grey. Legs whitish, anterior pair suffused with dark fuscous above, middle and posterior tarsi with faint dark fuscous rings at base of joints. Fore-wings dull grey along costa broadly suffused with blackish; a white very oblique streak from costa near base, and a white oblique streak from ⅓ of inner-margin, uniting in a white spot on disc before middle, whence proceeds a rather cloudy straight central longitudinal white streak towards apex of wing, becoming obsolete a little before it; below this streak and towards apex the ground-colour is suffusedly mixed with white; three other slender very oblique white streaks from costa, first rather beyond middle, indistinctly meeting central streak; second and third close together about ¾, running out nearly to apex; an ovate blackish apical spot, with a white blotch above and another below it, mostly in cilia; cilia white, towards anal angle fuscous-grey, with a blackish line round outer edge of apical spot, a blackish dividing-line beyond it, and a short hook-like blackish spot at extreme apex. Hind-wings and cilia fuscous-grey.

Allied to *E. niphadopla*, but not capable of being confused with it or any other species; the larger number of costal streaks, and the longitudinal central streak not extended to base are reliable points. Eight specimens taken at rest on the trunk of a fibrous-barked species of *Eucalyptus* near Parramatta at the end of January; I have little doubt that the larva had fed in the bark of the tree.

NOTES AND EXHIBITS.

Dr. Cox exhibited eight Stone Axe Heads, turned up by the plough at Castlereagh on the Nepean Flats. He was of opinion, from the position in which they were found, that they had been deposited in the grave of an aboriginal. Some time since a 30 similar axe heads were found under somewhat the circumstances on the other side of the river. All were bev to the centre, and not to one side as was sometimes the ca other districts. The Chairman stated that the stones dioritic.

◆

above and below. Antennæ whitish, with obsolete dark fuscous annulations. Thorax white, anterior margin narrowly blackish-fuscous. Abdomen ochreous-grey. Legs whitish, anterior pair suffused with dark fuscous above, middle and posterior tarsi with faint dark fuscous rings at base of joints. Fore-wings dull grey along costa broadly suffused with blackish; a white very oblique streak from costa near base, and a white oblique streak from ¼ of inner-margin, uniting in a white spot on disc before middle, whence proceeds a rather cloudy straight central longitudinal white streak towards apex of wing, becoming obsolete a little before it; below this streak and towards apex the ground-colour is suffusedly mixed with white; three other slender very oblique white streaks from costa, first rather beyond middle, indistinctly meeting central streak; second and third close together about ¾, running out nearly to apex; an ovate blackish apical spot, with a white blotch above and another below it, mostly in cilia; cilia white, towards anal angle fuscous-grey, with a blackish line round outer edge of apical spot, a blackish dividing-line beyond it, and a short hook-like blackish spot at extreme apex. Hind-wings and cilia fuscous-grey.

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WEDNESDAY, JUNE 30TH, 1880.

The President, the Rev. J. E. Tenison-Woods, F.G.S., F.L.S., &c., in the Chair.

MEMBERS ELECTED.

R. D. Fitzgerald, Esq., Deputy Surveyor General.

R. M. Johnstone, Esq., Launceston.

DONATIONS.

Inaugural Address etc., of the South Australian Institute.

From Museum of Comparative Zoology, Harvard College:—Binnie "On Terrestrial Air Breathing Mollusks," two vols.; and Bulletin of the Museum of Comparative Zoology, Vol. V., Nos. 2 to 10.

Boston Society of Natural History.—Proceedings, Vol. XIX., parts 3 and 4, and Vol. XX., part 1.

Koninklijke Akademie, Amsterdam.—Year-book, 1878, and Verslagen en Mededeelungen, 1879.

Royal Society of Victoria.—Trans. and Proceedings, Vol. XVI.

Report of the Smithsonian Institute, 1877.

Royal Society of Edinburgh.—Proceedings 1878-79.

A. W. Waters.—" On the terms Bryozoa and Polyzoa.

PAPERS READ.

NOTES ON THE MOORE PARK BORINGS.

BY JAMES C. COX, M.D., F.L.S., &c.

Plate XII.

The borings at Moore Park, of which the accompanying plate gives a good illustration, were commenced in May, 1879, under the able superintendence of Mr. John Coghlan. The spot selected for making the bore is situated about half-a-mile south of Baptist's Gardens, at the end of Bourke Street, Surry Hills, and is about 20 feet above the level of the sea. The drill used on this occasion was one of the Hydraulic Feed Diamond Drills, having a diameter of 2¼, and drawing a core of two inches in diameter. The boring continued uninterrupted up to the 10th April last (1880), when, at a depth of 1860 feet, operations were stopped through one of the tubes giving way, owing to a flaw in its side, at a depth of 300 feet from the surface.

In consequence of the very sandy nature of the spot selected for this experiment a stand three-inch pipe was driven for a distance of 143 feet, and at this point rock was reached. The bed of sand passed through had all the character of the ordinary drift sand of the surrounding hills, and was saturated with water, though the water did not rise higher than four feet six inches from the top of the tube. The rock first tapped was a white cellular sandstone, very soft, and, owing to the large size of the cells, easily broken. This strata of white sandstone continued for a depth of 900 feet from the point where it was first struck, only altering in density as it descended. At a depth now of 1043 feet from the surface, a ferruginous clay was tapped. This rock is known on this coast as the red iron band, the character of which is so well known that it does not require any minute notice, varying in colour according to the percentage of iron it contains. This ferruginous band was found to be 263 feet thick, carrying us to a depth of 1306 feet. The same band was struck at the

Botany borings, situated between Botany Bay and Port Ha at a depth of 900 feet, and was 260 feet thick, showing t has a dip of only three feet in a northerly direction in a di of about seven miles. The same band is about 750 feet the coal at Coal Cliff; and the coal crops out on a level wi sea. Taking 750 feet as the lower edge of this iron band the sea at Coal Cliff, and 1306 feet as its termination at Park, it is evident that it takes a considerable dip north The same iron band was tapped at the Newington borin 1100 feet; but the working of the boring was interrupted its perforation was completed.

It is an important fact that, not only the character of the but the dip which the rock takes can also be ascertained by of these drills. The rod when gripped to be raised canno is not permitted to revolve in the slightest degree, or it become unscrewed. It is kept in one position by pass through the jaws of the clamp, and in addition is guard two men to prevent its rotating. While the drill was p from the first upper bed of white sandstone into the red ferru bed, a stream of extremely black water came up the shaft, h very much the appearance of coal water; and it is very m be regretted that this dark coal-like water was not more mi examined. The core which came from this part of the showed some very strong evidences of coal (see specimen strange to say, the length of the core was considerably les the depth which the drill had penetrated at one or two draw

Having perforated the red ferruginous band at a dep 1306 feet, a white sandstone was tapped of a very fine gra dense texture, which continued for a depth of 110 feet, tak to a depth of 1416 feet. Below this, again, there were

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*It is quite possible that a core such as Coal would not stand the great produced by the rotation of the shaft, and would be broken up be shaft was drawn up, thus accounting for the core often not being as the distance penetrated by the drill.

of a coarse green sandstone, with scales of mica dispersed through it, which will, I believe, turn out to be scales of graphite. This rock is so coarse as almost to pass into a grit. Immediately below this there were about ten feet of a very hard blue sandstone very fine and dense in the grain. For thirty feet below this, a very hard blue sandstone was found, with dark partings of black shale. These black shale partings were full of a *phylotheca* (fossil coal plants and leaves), and when broken had a very characteristic resinous fracture. Below this came a dark sandstone with broad streaks of carbonate of lime running through the core longitudinally, causing it to split; this bed was about fifteen feet thick. Below this was found a rock of only two feet in thickness, but of a very interesting character, made up of broken fragments varying greatly in colour, but, as a rule, having the character of fragments of a greenish-slaty rock.

Now for the first time below this thin band the Estheria shells showed themselves. They were found in dark shaly streaks of irregular thickness, which were found to separate this layer of rock, which was a very hard sandstone, having an exceedingly fine grain. This bed was, as I have said, composed of dark shaly streaks and sandstone partings, the sandstone preponderating throughout, and was about 30 feet thick. We have now reached a depth of 1523 feet.

It will not be uninteresting here to mention that though this shell, if shell it may be called, was first struck at Moore Park, at a depth of 1523 feet, it was not found in the core raised at Port Hacking till they had reached a depth of 2160 feet. The two cores correspond wonderfully up to a depth of 1483 feet. The Estheria bed struck at Moore Park was altogether absent at Port Hacking, but there at the depth mentioned it was found in exactly the same character of shaly rock. At Port Hacking the drill entered quite a different class of rock at the depth at which the Estheria were found at Botany, it being a conglomerate of no less than 480 feet in thickness. It is difficult to account for this great difference. Mr. Coghlan believes that the bore at Port Hacking was over what he calls a large "crab-hole," originally a cavity which had gradually been silted up with a conglomerate material. But it is much more probable that the bore at Moore Park is over the rise, and the bore at Port Hacking over the depression of an undulation, such as supposed to exist in our coal beds.

The *Estheria* shell is nothing new to science, but its discovery is quite new to our Australian Fauna. Specimens of a fossil certainly have been found among the many valuable specimens in the collection of the late Rev. W. B. Clarke, which in all probability will turn out to be an *Estheria*, discovered at the brickworks near Botany, but they were never described by him as such, and are still so indistinct as to be doubtful in their character, at any rate, they are not this species, as they are much larger. I claim it therefore, as a new species, and call it "*Estheria Coghlani.*" I have called this *Estheria* a shell, but in reality, though extremely like a bivalve, it is not one. So like however is it to a bivalve that any one might readily be excused for mistaking it for one. A good figure of it is given in "Lyell's Elements of Geology," figures 490, page 450. These bivalve-like fossils are in reality the remains of fossil *Entomostraca*, of which *Estheria* is one of the genera. Lyell states that in the Trias beds of the United States two species of the *Estheria* are in such profusion in some shaly beds as to divide them like the plates of mica in micaceous shales; that these same Virginian coal measures are composed of grit, sandstone, and shell, exactly resembling those of older date in America and Europe; and they rival, or even surpass them in the richness and thickness of the seams, one of which is in some places from 30 to 40 feet in thickness, composed of pure bituminous coal. According to the monograph of the fossil *Esthonia*, published by the Palæontographical Society of London in 1862, by T Rupert Jones, F.G.S., there were up to that date fourteen species of fossil *Estheria* known and described—one in the Tertiary formations, one, and a distinct variety of the same, in the

Cretaceous and Wealden formations; three in the Jurassic; one, *Estheria minuta*, with its varieties in the Rhœtic stages, and the same species also in the Trias formations; three in the Permian, two in the Carboniferous, and one in the old Red Sandstone. We shall now have to add another to the Trias stages as found in New South Wales.

On the authority of Professor M'Coy and of the late Rev. W. B. Clarke, Rupert Jones states that "the Jurassic-like flora of Australia, and of Southern Africa, have been hitherto collected without affording any clear traces of the *Estheria*. In 1862 there were about twenty-two species of living *Estheria* recorded, and some of them were from Australia; and I believe there are still others to be described from Australia, or else the same species exist here as are found in other parts of the world. "Recent *Estheriæ*, says the same authority, are found in fresh, rarely in brackish water." Guided by this fact, and taking for granted that our fossils were true *Estheriæ*, and that *Estheriæ* have always had fresh-water habitats, we should suppose that the deposits in which they are found free from any appearance of having been drifted, must have been formed in rivers, lakes, or lagoons; but they are occasionally found to occur with marine shells, although they are sometimes found in strata destitute of marine fauna." Jones accounts for their association with marine evidences as being the result of "driftage, or of very rapid changes of condition such as might be brought about by the alternate occupation of a lagoon by sea and river water. Seeing too that the recent *Estheriæ* appear as it were suddenly (like the apus) in pools and ditches of rain water, and are quickly developed in tanks and ponds that are dry for even ten or eleven months in the year, it is not unlikely that pools of fresh water temporarily formed on a flat seashore may have been inhabited by *Estheriæ* destined to be quickly buried in the first wind-drift of sand, or at the return of high tides." The only part of these little shell insects, as they are designated by Latrelle, which are preserved in a fossil state,

is a shell-like coating composed of one or two pieces covering t
anterior thoracic segment.

Below this last *Estheria* bed came a bed of what I consider
be a volcanic mud 20 feet thick, having no traces of either t
Estheria or *Phylotheca* remains. The next bed perforated wa
shaly sandstone, containing large numbers of the *Estheria* in
shaly partings. In one of the fractures made, an impression w
found, which I believe to be that of a *Stigmaria*. In some pa
of this bed there were partings of a very light stone, whi
contained large numbers of *Phylotheca* impressions. This charac
of rock continued from 1543 to 1826 feet, or 283 feet in thickne
In addition to the light stone partings above mentioned, this ro
had partings in its lower portion of very dense, hard, heavy, sh
sandstone. As the drill went down, the character of the ro
gradually changed. It became very dark and fine in the gra
It was while boring through this character of rock, and at t
depth (1826 feet), that a jet of oil came up—or what was suppos
to be a jet of oil—which lasted for ten minutes, accompanied w
a loud report, caused by the escape of gas on removing the shacl
from the top of the drill-rod. The probability is that a cavity
the rock, full of compressed gas, had been penetrated, and t
when the shackle was unscrewed, the expansion caused the wa
and oily contents inside the tube above the core to be forced u
causing the appearance of a flow of oil, and the report whi
followed was caused by the same gaseous expansion.

From this point till the boring ceased at 1860 feet, the co
which came up, 34 feet in all, was full of *Estheriæ*, forming
times a distinct parting in the core, and the usual forms
Phylotheca plants were also very abundant. Having reached
depth of 1860 feet, owing to a flaw in one of the tubes, the bori
rod broke, leaving a portion in the bore. The broken tube w
found without much difficulty, and the rod was made compl
by unscrewing the broken portion and replacing it with a ne
one. The time lost in doing this, though very short, was sufficie

to allow the rods to become jammed by the quantity of sand or debris of the boring which was suspended in solution while the drill rods were rotating, and by a cessation of this motion the sediment settled down and jammed the rods. This was proved to be the case when an attempt was made to haul up the rods. A force of about 15 tons was employed, with large double and treble blocks, and rope of large dimensions which snapped like a thread as soon as a strain was exerted. Finding that this power was insufficient to raise the rods, one of Sir William Armstrong's powerful steam hydraulic pumps was used to force a pressure of water down the tube to remove the sediment. This proved ineffectual, owing, no doubt, to the corroding of the pipes with the wet sand, which prevented the water from passing between the tube and the borehole. So great was the pressure that, while the pump was working at the rate of 100 revolutions per minute, when the pressure must have been considerably over 1000 lbs. to the square inch, one of the tubes burst; and thus put an end to pumping operations. Another method for raising the rods was then tried, which proved so far successful that 1400 feet of rods were drawn from the hole. No doubt the whole of the 1860 feet could have been successfully extracted had not the stand piping, which had been driven through the sand for 143 feet from the surface, shifted its seat, or original position, on the hard rock to which it was first driven. The shifting of a quarter of an inch on one side would have been sufficient to permit the sand to come in, and fill the bore. I may here mention that the stand-pipe was fixed to its place on the rock by cement, which casing of cement must also have been displaced and broken before the sand could enter.

I have thus given you a hurried sketch of the strata met with in this important experiment. A minute analysis will still be required of each core of rock; and it is to be hoped that it will fall into the able hands of our Government Geologist, when we

may expect that the subject will be more scientifically h
than it has been in this slight notice.

NOTES AND EXHIBITS.

The President read extract from a letter from the Ex
W. Teitkins, who was formerly second in command
Expedition of Mr. Ernest Giles. Mr. Teitkins is enga
exploring north of the Australian Bight, or Bunda Plat
it is now called:

"I have travelled but little since I last wrote. The c
for many miles is either an uninterrupted Plain or else
and Spinifex sandhills. The water I have now struck is l
from the surface, and the strata passed through since I las
consist principally of sand gradually hardening into stone
vary in colour. Before reaching the water there was a thin s
of Ironstone about two inches thick, lying perfectly horizo
indeed do they all. The water was found in a dark c
sand, but what quantity there is of it I cannot say, in fac
a section of that well be placed by side of one of the low
the Leister Hills they would appear very much alike.
the hills the ground is black in many places with small
of Ironstone, so much so that it has the appearance of the
about a coal pit, and at the foot of some of the little clif
Ironstone boulders are lying, having the appearance a
yesterday they had been thrown upon the surface from
and yet the surface is Limestone. Terraces, perhaps, rath
cliffs these might be called. It is a remarkable thing t
granite is to be found north of the Oldea Sand Range, and
travelled everywhere in the neighbourhood, and the bla
that the nearest granite is at Wynbring, which is 120 r
the eastwards. I have been there, and know that granit
upon the surface all through the dense Mulgar scrubs, th

to the shores of Lake Gardiner. And these granite boulders often have large reservoirs of water on them, on which the natives depend for their supply of water. The Plains upon which my well is situated are entirely waterless, except a few little pockets that occur in the Limestone, and which seldom contain more than buckets, and seem to me to be placed there by a kind Providence to enable the simple denizens of these wilds to traverse them occasionally in safety and comfort. Once let him reach the Mallee scrubs, and he is as safe and assured as if a river flowed at his feet, for in a very little time he would have a supply from the roots of a *Eucalypt* or *Casuarina*. At this particular time of the year a white substance is found upon the Mallee leaves; you have seen it, no doubt; it is commonly called "manna," and is a secretion formed by a small insect, under which its eggs are laid, and upon the leaf. This is collected in enormous quantities, and any savage you meet will offer you his wammar or bale of this substance. Seen in a lump as they carry it, it has a dazzlingly white appearance, and svery is weet and agreeable. In a week or thereabout Rigel *(Beta Orionis)* will set with the sun, and then they know that the Emu commences to lay, and live for a season upon its eggs, then a succession of roots and animals ensue, and during the fervid and blistering heat of summer they live almost entirely upon the eggs of the Mallee Hen *(Leipoa ocellata)*, cheerful, happy, contented, and clever, with wondrous powers of endurance and self-control, with laws of morality that would be observed but by few communities of civilized beings.

"I can imagine no people more happy in their innocence and ignorance than they are; last summer over 100 blacks were collected here, met—as they often do—to see each other, and exchange their weapons or tools, and have a week or two of social intercourse—a corroboree and so on. The whole of them were painted and feathered, and looking very fierce and terrible. Hideous howls and cries rent the midnight air when they had a corroboree; but I never was molested, and often for days I was entirely alone. They used to bring me all the eggs, pick out the fresh ones and give them to me, and, with a little present of sugar or matches, go off quite happy. Indeed, but for their timely supply of eggs I should have been in a position of some danger, for my supplies failed me, and we really had nothing else. I could write to some length upon the subject, but to call them miserable and degraded is a very grave mistake. I have dealt with the fierce tribes of the Queensland interior, and of West Australia, and on the overland telegraph line, but never met a more harmless race than these. In your travels you were not so fortunate I think. What it may be when the whites appear, I cannot say—trouble may be brought on then, but, often enough the white man is the aggressor.

"A powerful diamond-drill is now at work, boring for water North of Eucla, others will find water as I have done; and before long, these solitudes will be busy centres of pastoral industry, but few will think of the weary anxiety that was experienced by the pioneer. I make but poor headway with my paper for the R.G.S., for I use the axe more than the pen; and they will lose but little if it never leaves my writing-case. I anxiously look forward to the time when your letter may arrive which will refer to the specimens forwarded now eight months or more since. I expect to reach Fowler's Bay in about two months time. The questions that I had intended to ask were concerning the Ironstone and the Granite, and the Sand Range, and how to account for a shell deposited 1,200 feet above Oldea, and the Range intervening. I enclose a tracing drawn to scale, but roughly illustrating the known extent of Granite, and the Oldea Sand Range."

The President then stated that he had been requested by Dr. Hector, the Director of the New Zealand Geological Survey, to furnish a Pælontological report on the Fossil Radiata of the tertiary formations of that Colony. This request was made at the time of the International Exhibition on behalf of the Colonial

Government, but his (the President's) many occupations did not permit the completion of the work until now. The results of the study of these organisms were so very important and interesting that he felt sure a brief *resumé* of them would be acceptable to the Society.

He had found that in the Tertiary period, the New Zealand radiate fauna was as distinct from that of Australia as it is now, and that while comparatively poor in species, it was richer than at present. It was principally distinguished by the number and variety of the representatives of the genus *Flabelium*. *Trochocyathe* were also found similar to the Miocene fossils of Europe. These were scarcely known in Australia as fossils. Some new and interesting forms were also discovered which required new genera for their reception. It was remarkable that the genus *Balanophyllia* which had numerous species in Australia both living and fossil, had only two species known in New Zealand. One of these was a peculiar and exceptional form. In the class *Bryozoa* he had found two species of *Fasciculipora*—a genus which had hitherto been regarded as confined to the Lower Pliocene of Europe. Probably they flourished in both seas contemporaneously. It was, he considered, a fact of more than ordinary interest in natural science that two such characteristic and closely allied organisms should flourish at the same epoch, in such remote seas as those of Britain and New Zealand. The differences between the fossils were so small that if they were found in the same beds they would be regarded as mere varieties. The *Bryozoa*, common to the New Zealand and Australian tertiaries, were very numerous and he was inclined to regard the Oamaru and the Mount Gambier Limestones as contemporaneous. This would require a modification of existing conclusions, for the New Zealand formations were thus younger, or the Australian older, than the geologists of the respective Colonies were at present inclined to regard them. In conclusion the President laid his drawings (32 in number) of the fossils on the table for the inspection of the members; and he stated that his report would be published, with illustrati the course of a couple of months.

Mr. Macleay called the attention of the Society to important discovery by M. Wickersheimer, of the Unive Berlin.—It is a Fluid for the Preservation of Anim Vegetable Tissues, which is said to surpass anything h known in its power of preserving the colour, form, and el of specimens treated with it. The discovery has been pur by the Prussian Government, and been made public f benefit of the scientific world by the Minister for Instr The formula for the preparation of the Fluid is as follow 3,000 grammes of boiling water dissolve—alum, 100 gra common salt, 25 grammes; saltpetre, 12 grammes; carbo potash, 60 grammes; arsenious acid, 10 grammes. After and filtering, add to every 10 litres of the solution, 4 li glycerine and 1 litre of methylic alcohol. There are di modes of applying this fluid. Anatomical preparations t to be preserved dry, are immersed in the fluid from six to days, according to their size, then taken out and dried in th air. Hollow organs such as the lungs, &c., must be fille the Fluid, then laid in a vessel containing the same liqui afterwards distended with air and dried. Smaller animal as crabs, beetles, lizards, frogs, &c., if the natural colours be preserved unchanged, are not to be dried, but put imme into the preparation.

The same Fluid may be used for the purpose of pres human bodies during transportation, or even for more pern embalming. This very valuable discovery has already been tested, and everywhere with the most perfect success. Pr Barbeck, at a recent meeting of the Philadelphia Acade Natural Sciences, described a number of preparations showed beautifully the combined movements of the chest, l and other parts engaged in the mechanism of breathing. S snakes which had been treated with the Fluid more than previously permitted of undulatory and spiral movements. Lungs thus prepared may, even after years, be inflated by means of bellows. Such old lungs were seen to swell to ten times their size in the collapsed state, the lobes became distinct, the brown colour gradually changed into red, and the whole organ appeared as if taken from a fresh body. Sections of delicate tissues, morbid formations which have been removed by an operation, will appear after months as if in a fresh state, and may thus be preserved for future study. All sorts of vegetable organisms may also be preserved in this Fluid. A colony of fresh water *algæ*, which had been in this Fluid for a year, appeared to be growing in the water. To some of the wonderful properties of this great discovery I can myself bear testimony. The bottle which I now exhibit contains some specimens of the Red Mullet preserved in the Fluid, of which I have just given you the history. The Red Mullet is remarkable for the splendour of its colouring when alive, and for the rapidity with which the bright colouring disappears after death. The specimens I now show you have been for more than a month in preparation, and yet, as you perceive, they retain their colour unchanged. The other bottle exhibit contains a bit of beef; it has been in the preparation for a fortnight, and looks as if it had been only just cut from the living animal. The advantages of this Fluid for preserving organic substances are many as compared with alcohol. It is cheaper, the cost not exceeding 5s. 6d. per gallon. It is safer, not being inflammable. It is more portable, two-thirds of the material being water, which can be got anywhere. It preserves the natural colour of the object preserved, and it does not harden and distort the fibres in the way which alcohol does.

Dr. Cox exhibited portions of the Core raised by the Diamond Drill, in illustration of his paper.

P. Mackay, Esq.—The Head and portion of the body of a Cobra (*Calobates*), taken from a piece of timber in the Parramatta River.

C. S. Wilkinson, Esq., F.L.S.—The Tooth of a *Dip* together with Prof. Owen's plate.

J. Hobson, Esq.—Several butterflies, sp. *Daneis erippus*, were taken at a considerable distance from the coast of Au

The President exhibited a *Dolomite* core which had been c by the Aboriginals for spear-points; from Bathurst.

Mr. Palmer.—An Aboriginal's Stone Axe-head, fron Stephens.

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WEDNESDAY, JULY 28TH, 1880.

The Vice-President, W. J. Stephens, Esq., M.A., in the

MEMBERS ELECTED.

K. H. Bennett, Esq., of Yandendan, Booligal.
H. A. Gilliat, Esq., Department of Mines.

DONATION.

Journal of Conchology, No. 11, Vol. II., from Messrs. Brothers, Leeds.

PAPERS READ.

NOTES ON PLANTS, COLLECTED BY MR. EDW. READER, VICINITY OF MOUNT DROMEDARY.

BY BARON FERD. VON MUELLER, K.C.M.G., M.D., F.

Since 1860, when I examined the vegetation on the Gen were aware, that a multitude of Plants known to advance ward to Illawarra, did not extend into even the most south-e part of Gippsland, though many other plants were known to reach so far south. Thus we remained in uncertainty, the bulk of the peculiar vegetation of the Blue Mountains and the Illawarra District really reached its most southern termination until last autumn. Mr. Edward Reader, a resident near Mount Dromedary, became induced to gather the plants of his vicinity with a view of tracing the southern limits of the more northern Plants of New South Wales. This he did with a disinterested zeal and energetic toil, which are beyond all praise. The series of species never before found so far south, is already sufficiently advanced to offer it for publication; though during the spring months many other, particularly herbaceous Plants, would likely be added, if search in his district could be continued.

Mr. Reader, who was formerly in scientific correspondence with the Rev. W. B. Clarke, defines the geologic formations of the Mount Dromedary country as consisting of granite, coarse grits, and conglomerate of comparatively recent date, resting on Silurian slates, intersected with dikes of porphyry. The mountainous nature of the district, as well as the multitude of water-courses which flow through it, must render the Flora there eminently rich, especially as also some tracts of heathy land exist there; and we thus derive much additional information particularly of geographic interest concerning the flora of the district.

The species, for which already far more southern localities can be recorded, are the following:—

Citriobatus pauciflorus, Cunningham.
Abutilon oxycarpum, F.v.M.
Hibiscus trionum, Linné.
Seringea platyphylla, Gay.
Acronychia Baueri, Schott.
Ficus rubiginosa, Desfontaines.
Malaisia tortuosa, Blanco.
Laportea gigas, Weddell.
Baloghia lucida, Endlicher.
Helichrysum glutinosum, Bentham
Ehretia acuminata, R. Brown.
Solanum stelligerum, Smith.
Marsdenia flavescens, Cunningham.
Macrozamia spiralis, Migual.
Dendrobium pugioniforme, Cunningham.
Pterostylis grandiflora, R. Brown.
Commelyna cyanea, R. Brown.

Breynia oblongifolia, T. Mueller.
Deeringia celosioides, R. Brown.
Desmodium brachypodum, Gray.
Haloragis alata, Tarquin.
Backhousia myrtifolia, Harvey.
Eucalyptus maculata, Hooker.
Psychrotria loniceroides, Sielier.
Carex declinata, Boott.
Cladium asperum, F.v.M.
Stipa verticillata, Nees.
Cenchino australis, R. Brow
Platycerium aloicorne, Desva
Asplenium caudatum, G. For
Polypodium tenellum, G. For

To these must be added still, *Santalum obtusifolium*, R. Br but this one has been traced also into the colony of Vic where Mr. Reader found it very sparingly on the Genoa. It be added that he found *Ehretia acuminata* and *Marsdenia flave* within about thirty miles of the boundary-line, and that he n *Eucalyptus maculata*, and *Macrozamia spiralis*, within a few of Twofold Bay. *Eucryphia Moorei*, was traced into Vict territory before by Mr. C. H. Walter.

Among the Plants shown for the first time to be natives of South Wales by Mr. Reader's collections, are :—*Acacia supp* F.v.M., *Aster axillaris*, F.v.M., and *Lepidosperma elatiu* Labillardiére; these were obtained near Mount Dromedary. learnt also that *Livistona australis*, occurs in the coast-g south of Eden.

EUCALYPTS OF THE COUNTY OF CUMBERLAND: THEIR CLASSIFICA HABITAT, AND USES.

BY THE REV. DR. WOOLLS, D.D., F.L.S., &c.

Now that, through the labours of Baron F. von Mueller species of *Eucalyptus* occurring in the County of Cumbe have, for the most part, been accurately defined, it may be u to arrange them according to the peculiar features which present, and to place on record such particulars respecting as may lead to more accurate investigation of their prop and uses.

Although the Colony of New South Wales has been established ninety two years, it is only since the publication of the Baron's *Eucalyptographia*, that some of the commonest species have been identified, and referred to their proper places in the systematic arrangement. The descriptions in the third volume of the *Flora Australiensis*, founded on specimens forwarded to Europe from time to time since the establishment of the Colony, afford indeed a most valuable basis for the study of the genus, and the greatest credit is due to Mr. G. Bentham, C.M.G., for the manner in which he has thrown together the researches of all previous writers on our *Eucalypts*. That eminent Botanist, however, notwithstanding all the information which he was enabled to collect, had many difficulties to contend with, for, not having the advantage of seeing the trees in their native forests, or having any means of distinguishing the species, excepting from the dry material before him and the imperfect notes of collectors, "he was compelled," he tells us, "to establish groups upon such characters as appeared to him the most constant among those which were supplied by the specimens." The labours of Mr. Bentham in thus dealing with some 135 species are beyond all praise, and whether the artificial mode of classification which he elaborated be ultimately adopted or not, we cannot but admire the patient investigation and powers of organization which he has exhibited. With that candour, however, which characterises great minds, Mr. Bentham acknowledged his inability to devise any system of classification which is not liable to objection; and therefore, whilst regarding the series, suggested by himself, as simply provisional, he expresses a hope, that Baron Mueller may be able to give to the Scientific world "a truly natural arrangement founded upon the proposed cortical or any other system, which experience may induce him to adopt." In the work now in course of publication, the Baron is simply figuring and describing species, and collecting all such information respecting them, as may be useful in a scientific or industrial point of view;

and whilst he brings out fully in sectional and magnified draw the figure and opening of the anthers, for the purpos illustrating Mr. Bentham's artificial system, he also furni data, partly from his own observations, and partly from tho his correspondents in Australia, for grouping the species accor to the nature of their bark.

Of the species now known in Australia—probably about 150 are indigenous in the County of Cumberland, and, accordin the artificial system, they may be placed in the following orde

(1.) *Renantheræ*, that is such species as have for the most perfect anthers of a uniform shape, viz.

1. *E. radiata*, (Sieb.)
2. *E. obtusiflora*, (DC.)
3. *E. capitella*, (Sm.)
4. *E. eugenioides*, (Sieb.)
5. *E. piperita*, (Sm.)
6. *E. pilularis*, (Sm.)
7. *E. acmenoides*, (Schan.)

(2.) *Heterostemones*, such as have the outer stamens anant ous, whilst the perfect ones are small, globular, or truncate,

1. *E. sideroxylon*, var. of *E. leucoxylon*, (F.v.M.)
2. *E. paniculata*, (Sm.)
3. *E. hæmastoma*, (Sm.)
4. *E. Sieberiana*, (F.v.M.)

(3.) *Porantheræ*, such as have the stamens all perfect, and anthers small and globular, opening in small circular pores,

1. *E. polyanthema*, (Schau.)
2. *E. largiflorens*, (F.v.M.)
3. *E. hemiphloia*, (F.v.M.)

(4.) *Micrantheræ*, such as have the anthers very small, ope in lateral slits, viz.

1. *E. siderophloia*, (Benth.)
2. *E.* sp.? (F.v.M.)
3. *E. crebra*, (F.v.M.)

(5.) *Normales*, such as have the stamens all perfect, the ant oblong-ovate, or nearly globular, the cells perfectly disti parallel and opening longitudinally, viz.

1. *E. longifolia*, (Link & Otto.)
2. *E. robusta*, (Sm.)
3. *E. botryoides*, (Sm.)
4. *E. viminalis*, (Labill.)
5. *E. tereticornis*, (Sm.)
6. *E. punctata*, (DC.)
7. *E. saligna*, (Sm.)
8. *E. resinifera*, (Sm.)
9. *E. corymbosa*, (Sm.)
10. *E. maculata*, (Hook.)
11. *E. eximia*, (Schau.)

This system of grouping the species has its merit in the arrangement of specimens for the herbarium, and also in enabling the observer to identify any species which is remarkable for the shape or opening of its anthers; but it labours under two defects, viz., that it places in close proximity trees differing materially in bark, wood, and fruit; and that it sometimes separates widely those species. which, in the minds of the Colonists, must ever be associated with each other.

The cortical system of Baron Mueller, therefore, is the more natural and practical, and although in individual trees, the bark may differ sometimes from the typical character of the section in which it is placed, yet there is little difficulty in determining, from a comparison of several trees, whether a species should be grouped with the smooth-barked, half-barked, or fully barked kinds. Solitary specimens of the common Grey Gum *(E. tereticornis,)* have sometimes been found with fibrous bark on the butt; and, on the other hand, the Box *(E. hemiphlora)* and the Woolly Butt *(E. longifolia)* vary occasionally from the ordinary type in proportion to their age and the nature of the soil. The Blue Gum also *(E. saligna)*, which, for the most part, has very smooth bark, is found here and there with rough bark on the butt.

Baron Mueller in taking an extensive view of specimens from all parts of Australia, is disposed to amalgamate species differing very much in the character of the bark, and he refers the aberrations from typical form to geological considerations, the elevation above the sea-level, and the range of temperature. The deviations, to which I refer, are in some instances very remarkable, and should they be proved to result from local causes, as that learne writer suggests, many of the so-called species of *Eucalypts* wil be regarded as mere varieties. As it would be premature to ente upon this question, until a patient investigation of all the know species has demonstrated the value of Mr. Bentham's artifici system, I propose to group the species of the County of Cumbe land according to the cortical system of the Baron, and then t treat of them individually.

(1.) *Leiophloiæ*, such as have the bark smooth on every sid after the shedding of the outer layer, including the trees commonl called Flooded Gum-trees, White Gum-trees, or Gum-trees i general. This section is well-defined and comprises about a thir of the *Eucalypts* in the County of Cumberland.

(2.) *Hemiphloiæ*, such as have the bark in the lower part o the trunk, persistent, wrinkled, and full of clefts, in the uppe part and in the branches, rendered smooth by the shedding of th outward layer. The common Box and Black-butt may be regarde as typical of this section, but, as it will be seen in the process o inquiry, some species pass from the *Hemiphloiæ* to the *Leiophlo* as they advance in age.

(3.) *Rhytiphloiæ*, such as have the bark everywhere persisten wrinkled, full of clefts, and solid within, as the trees calle Mahogany and Bloodwood, including some of the largest tree in the neigbourhood of Sydney.

(4). *Pachyphloiæ*, such as have the bark for the most par persistent, wrinkled, and fibrous within. Of this section, th Stringy Bark is the type.

(5.) *Schizophloiæ*, such as have the bark everywhere persistent deeply furrowed, and solid within. This section comprises al the Iron Barks.

According to this system, the species of the County o Cumberland will stand in the following order :—

(Section I., LEIOPHLOIÆ.)

1. *E. radiata*, (Sieb.)
2. *E. saligna*, (Sm.)
3. *E. hæmastoma*, (Sm.) and var. *E. micrantha* (DC.)
4. *E. viminalis*, (Labill.)
5. *E. tereticornis*, (Sm.)
6. *E. punctata*, (DC.)
7. *E. maculata*, (Hook.)
8. *E. obtusiflora*, (DC.)

(Section II., HEMIPHLOIÆ.)

1. *E. Sieberiana*, (F.v.M.)
2. *E. pilularis*, (Sm.)
3. *E. hemiphloia*, (F.v.M.)
4. *E. longifolia*, (Link & Otto.)
5. *E. largiflorens*, (F.v.M.)

(Section III., RHYTIPHLOIÆ.)

1. *E. acmenoides*, (Schau.)
2. *E. botryoides*, (Sm.)
3. *E. robusta*, (Sm.)
4. *E. resinifera*, (Sm.)
5. *E. corymbosa*, (Sm.)
6. *E. eximia*, (Schau.)
7. *E. polyanthema*, (Schau.)

(Section IV., PACHYPHLOIÆ.)

1. *E. capitella*, (Sm.)
2. *E. eugenioides*, (Sieb.)
3. *E. piperita*, (Sm.)

(Section V., SHIZOPHLOIÆ.)

1. *E. siderophloia*, (Benth.)
2. *E.* sp.? (F.v.M.)
3. *E. crebra*, (F.v.M.)
4. *E. paniculata*, (Sm.) and var. *angustifolia*, (Benth.)
5. *E. leucoxylon*, (F.v.M.) var. *sideroxylon*, (Sieb.)

With one exception, (viz. *E. obtusiflora*) all the species mentioned in this list are trees, but, it may be remarked, that none of them attain the gigantic dimensions of *E. amygdalina*, (the "Giant Eucalypt" of Victoria), or *E. diversicolor*, (the "Karri" of Western Australia), which, in favourable localities, are known to have exceeded 400 feet in height, with a diameter of 25 feet. It is probable that no *Eucalypt* in the County of Cumberland exceeds 160 feet, whilst the fruit of all the species is comparatively small, even in the largest trees. The fruit of *E. Youngiana*, (F.v.M.,) in South Australia sometimes exceeds two inches i diameter, which is about four times that of *E. longifolia*, or ou common Woolly Butt, a species remarkable amongst the *Eucalypt* of New South Wales for the size and thickness of its seed-vesse

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ON A RARE SPECIES OF PERCH, FROM PORT JACKSON.

BY E. P. RAMSAY, F.L.S., CURATOR OF THE AUSTRALIAN MUSEUM SYDNEY.

ANTHIAS LONGIMANUS, *Gunther.*

Anthias longimanus, Gunth., Cat. Fishes, Vol. I., p. 94.

D. 10/20. A. 3/8. V. 1/5.

As this fish is apparently new to our waters, the followi notes may be of interest to the Society:

The horizontal diameter of the eye is one-fourth of the leng of the head, and equal to its distance from the snout. The heig of the body is one-third of the length, exclusive of the caudal fi the length of the head is three times and two-thirds in the sam Snout very short, mouth oblique; the maxillary reaches to belo the anterior third of the eye. The præoperculum is finely serrat on both limbs and rounded at the angle; the operculum has a fl spine at its upper angle, and a smaller flat spine below it with denticulated margin. The dorsal fin is low, the third spine t longest, the membranes connecting the spines and rays are cloth with scales for two-thirds of their height; the pectorals are lon narrow, of twenty rays, much longer than the head, and reach the fourth dorsal ray, and first anal spine; the anal is modera its tip reaching to the vertical from the last dorsal ray; t ventrals are inserted just behind the vertical from the base the pectorals, and are a little longer than half their length. T lateral line terminates about six or seven scales from the base the tail, the upper lobe of which is the longest. The between the eyes is one-fourth longer than the horizontal diameter of the orbit.

The general colour of this beautiful fish is of an intense reddish vermilion, shaded with light rose-lake on the sides, and orange on the belly; on the sides are numerous spots forming irregular lines of bright yellow, irregular lines of same colour on the cheeks. The lateral line silvery-blue. All the fins rich bright reddish-vermilion, without spots. The eye is bright orange, iris black.

The fine specimen on which the above notes are made, was forwarded to the Museum by Mr. Emerson of Sydney, this morning, (17th July, 1880), and was captured near the Heads. It is the only specimen I have seen. It answers tolerably well to Dr. Gunther's description of *Anthias longimanus*, but appears to be a broader fish, but more elongate than *A. rasor;* the head is very short and much rounded in front, the lower jaw when the mouth is open is a little longer than the upper; the height of the body is four times in the total length, the length of the head measured to the tip of the operculum is four and one-third in the total length (to the tip of the upper lobe of the tail).

It will be seen that these proportions do not altogether agree with Dr. Gunther's measurements, which were taken from a stuffed specimen, probably stretched in skinning and stuffed out of shape.

NOTES ON *Histiophorus gladius.*

BY E. P. RAMSAY, F.L.S., &C.

Plate VIII. [Lettered in error *Xiphius gladius.*]

A remarkably fine specimen of this rare Fish, the subject of these few remarks, was captured on our coast a few days ago, (July 4th 1880) by Mr. Andrews and party, about six miles south of Wollongong, while schnapper fishing; they found many of the fishes they had hooked were taken from their lines, and soc a large sword fish in pursuit of a schnapper got entangled anchor line which had become twisted round its snout, t affording an opportunity for Mr. Andrews to harpoon it, was successfully done; after towing the boat for severa the animal became exhausted and was in turn towed Shortly after being harpooned the fish disgorged a nu large schnapper, *(Pagrus unicolor)* and finally threw stomach itself. During the engagement it was seen to leap feet in height out of the water. On Monday night the sp was brought to the Museum in quite a fresh state.

Under the gill-cover we found a small sucker-fish *(Eche* a pale pink color, about eight inches in length, but n parasites on these parts. On the back, sides, and at the the fins and various parts of the body were the rem numerous large, black parasites, also some living exampl the neck elongated, of a substance like chitine, and with like filaments at the end; the head buried a considerable d (sometimes 3 inches) in the flesh. The body of this Epi blackish, transversely wrinkled, and carries at its juncti the plumose portion two long wire-like filaments; the rounded, and at its junction with the "neck" are two sho about 0·1 inch in length; this parasite is probably a spe *Pennella (Oken.)*

On the tail were a few crustaceans *(Caligus)* of the same as those usually found on Sea Sharks occurring in Port and on our Coast; strange to say neither the stomach intestines contained any parasites.

On dissection the animal proved to be a male and of consi age. It is I believe the largest on record, measuring 1 inches to the *centre of the caudal fin*, the upper lobe of which m 2 feet 9 inches, and the lower 2 feet 7 inches.

1st Dorsal 35. 1st Anal 12-13. Ventral 1.
2nd ,, 7. 2nd ,, 6.
Diameter of the eye 3 inches by 2½.

The dorsal fin is about half the height of the body, the hump compressed below the dorsal, and the profile strongly curved to the snout, the membrane of the dorsal fins uniform in color. The height of the body measured from the base of the dorsal spines is about one-fifth of the total length, and the length of the head from the tip of the snout to the posterior margin of the gill-cover is one-fourth of the total length.

The general color is a deep bluish-black (much brighter when alive) on the back and sides, above the median line, below which it is of a bright silvery hue almost white on the belly.

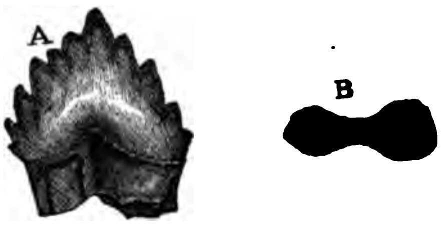
The following are the measurements:—

Total length 13 ft. 4 in., to the tip of the tail 14 ft.
Upper lobe of caudal 2 ft. 9 in. } from pits at the root of the tail.
Lower lobe of caudal 2 ft. 7 in. }
Small fleshy lobe on side of caudal at the base 5·5 x 2·5 high.
Height of body opposite the dorsal fin 2 ft. 6 in.
Height of first dorsal from base 18 in.
Height of second dorsal from base 5 in., extent at base 14.5.
Length of pectoral fin 2 ft. 4 in.
Its width at the base 7 in.; four inches from the body 5 in.
Snout from nostril 2 ft. 7 in.
Length of head from nostril to the hinder margin of the gill-cover 20 in.
Length of head with snout 4 ft. 5 in.
From tip of snout to the centre of the eye 2 ft. 10 in., from thence to gill-cover 16·14.
First anal 14 in., second anal 4·5.
Breadth of body at first anal 2 ft.
Length of lower mandible to gape 16·5, to gill-cover 21 in., from tip of snout to pectoral fin 2 ft. 2½ in.; from tip of snout to first dorsal 4 ft., tip of snout to gape 3 ft. 2 in.

ON A MOLAR TOOTH OF ZEUGLODON FROM THE TERTIARY BEDS ON THE MURRAY RIVER NEAR WELLINGTON, S.A.

BY E. B. SANGER, ESQ., SOUTH AUSTRALIA, C.M.L.S. N.S. WALES.

The tooth and the fragments of a second were found in a bed of yellow calcareous clay, containing specimens of *Echinus*, *Spatangus*, *Clypeaster*, *Pecten*, *Turritella*, *Corbis*, and *Spondylus*. The tooth is compressed laterally, and strongly serrated on the anterior and posterior edges of the crown, forming four cusps on one edge, six on the other and one median and terminal. (See figure). The cusps increase in size from the base up, the median cusp being the largest. At the junction of the double fang and the crown the tooth suddenly thickens out, thus forming a ridge which runs around the tooth curving up in the middle on both sides in the "yoke" thus making a sharp line of demarcation between the crown and the fang. The crown is covered with enamel which in one place has broken or peeled off, showing the dentine beneath. The double fang is formed by two pillars connected mesially by a thin isthmus through which the pulp-cavities of the pillars are connected. The two pillars and the crown arching over them form the characteristic "yoke" from which the name is derived. The half of the tooth of which the edge bears four cusps, and its corresponding pillar or fang is larger and thicker than the other half; and the pulp-cavity of its



E. B. Sanger, del.

A. Molar tooth of *Zeuglodon Harwoodii*, nat. size.

B. Transverse vertical section through the fangs, nat. size.

pillar is larger than the pulp-cavity of the other pillar. In a cross section faint lines can be seen radiating from the pulp-cavities. (See fig. B.)

The antero-posterior diameter at the base of the crown is 9/10 of an inch, the median transverse diameter 4/10, and the median height of the crown is ¾ of an inch. The transverse diameter of the larger fang or pillar 3/10, and the smaller ·25 of an inch; the diameter of the connecting isthmus is 1/10 of an inch. The fang has been broken off, though probably it was not much longer. I am inclined to think that possibly the isthmus was wanting in the portion broken off, so that the pillars became two distinct fangs. The pillars are in fact morphologically, fangs. The tooth is possibly from a young animal as the cusps are hardly at all worn. It differs widely from a molar tooth of *Zeuglodon cetoides*. It is very much smaller and resembles somewhat a molar tooth of a seal.

The *Phocodontia*, comprising *Zeuglodon* and its kindred, in fact are connecting links between the *Cetacea* and the *Pinnipedia*. The length of *Zeuglodon cetoides* has been estimated to be seventy feet. Allowing that this tooth belonged to a young animal, I hardly think that the adult would have been over twelve or fifteen feet in length. It was evidently carnivorous. The beds in which the tooth was found are decidedly Eocene in character, though not identical with any particular division of the Eocene. I have identified from the same beds the following characteristic Eocene fossils viz.: *Lamna elegans*, *Notidanus primigenius*, *Carcharodon angustidens*, *Nautilus (Aturia) zic-zac*, *Pecten Poulsoni*, *Crassatella alta*, and *Clypeaster (Mortonia) Rogersi*. Its age corresponds therefore with *Z. cetoides*, found in the Eocene beds of the Southern United States. It is to be hoped that more traces of this interesting and aberrant Cetacean will be found. I propose naming this species, which possibly may be a new genus, *Zeuglodon Harwoodii*, in honor of James C. Harwood, Esq., formerly of

Wellington, S.A., to whose kindness I owe this and many oth fine fossils.

NOTES AND EXHIBITS.

J. Brazier, Esq., C.M.Z.S., etc., exhibited *Helix pomatia*, *aperta*, and *H. melanostoma*, showing the aperture covered with thin membrane of animal matter, giving the shells the appearan of being operculated. In *H. melanostoma* it is very thin, in t others, much thicker. Also, thirteen species of the Fossil gene *Gonitites (? Gonotites)*, *Ammonites*, and *Rhynchonella*, all fr France. And, *Voluta (Lyria) deliciosa*, with operculum, fr Wautoro, near Noumea, New Caledonia.

The Vice-President exhibited a series of Fossils from t Namoi and from Campbelltown.

The Secretary.—A large excresence or bunch of galls from *Acacia* (green wattle), formed by *Cynips;* and the nidus of a la arboreal spider.

WEDNESDAY, AUGUST 28TH, 1880.

The President, the Rev. J. E. Tenison-Woods, F.G.S., etc the Chair.

DONATIONS.

Proceedings and Transactions of the New Zealand Instit Vol. XII.

Eucalyptographia, Decade VI., from Baron F. von Muel K.C.M.G., etc.

Journal of the Royal Microscopical Society, Vol. III., No. 3.

Report of the Salmon Commissioners, Tasmania.

Geological Sketch Map of Charter's Towers Gold Field and the Coast.

PAPERS READ.

ON A NEW SPECIES OF *Flabellum*.

BY THE REV. J. E. TENISON-WOODS, F.G.S., F.L.S., &c.

The coral here described was obtained at a moderate depth from Bass' Straits. It was attached to a dead oyster shell. It differs from any Australian form previously described by the almost cylindrical form and the irregular tubular radiciform appendages. The genus is very poorly represented in our present Australian Marine fauna, though this was not the case in the later tertiary period. The living and fossil species have no common characteristic form, but the present species is very aberrant from all previously known.

Flabellum tubuliferum, n. s.—Corallum tapering from a proportionately thick pedicel, cylindrical or only slightly compressed, of pale livid color and darker purple within, irregular in growth with well marked incremental lines, with three or four short tubular radiciform appendages projecting straight down along the axis, irregular and apparently broken. Costa very fine, corresponding to the interstices of the septa. Epitheca pellicular. Septa in four systems, developed according to the orders, undulating at the edge and slightly granular at the sides. Alt. 14, diam. 7, mil. Specimen which is much damaged is deposited in the Sydney Museum. The tubular appendages arise from about one-third the height from the base.

Descriptive Catalogue of the Fishes of Austr

By William Macleay, F.L.S., &c

Part I.

The following Catalogue is compiled with the view of c or lessening the difficulty which the student of Ichthy this Country has to encounter from having to refer for th and identification of the species, to numberless publicat variety of languages, which are only to be found in ve and well-stocked libraries. Up to a certain period Dr. G Catalogue of the Fishes of the British Museum met this d but the vast additions which have been made to the Australia since the date of that publication has made obsolete as a record of Australian Fishes. This may be from the fact that while the number of Acanthopte Fishes given as Australian in Dr. Gunther's Catalogue exceed 210, the number recorded in the Catalogue of now lay before you the first part, comes up to 650 species.

The classification I have adopted is entirely that of Dr. (and I have never departed from his nomenclature, exce a very few and easily explained instances.

The descriptions given of the genera and species a wherever available, taken from Dr. Gunther, as being m and to the point than those of most authors, and in ever have been as brief as possible, so as to keep the Catalogu the smallest limits. For the same reason I have not giver in rare instances, the synonyms of the species, and I have the references to one or two of the most useful and best No description is given with those species which ha previously described in the Proceedings of this Society.

Under each genus I state its general geographical ran under the species its Australian habitat. The term Au includes all seas from the South Coast of New Guine

South of Tasmania, and from the West Coast of New Holland eastward as far as Norfolk Island.

KINGDOM *ANIMALIA*. SUB-KINGDOM *VERTEBRATA*.

CLASS FISHES.

Vertebrate animals, with a double circulation and cold red blood, inhabiting water, and breathing through gills.

SUB-CLASS I. TELEOSTEI.

Fishes having a bony skeleton.

ORDER I. *ACANTHOPTERYGII.*

Teleosteous fishes with one or more of the rays of the dorsal, anal, and ventral fins spiny and not articulated, and with the inferior pharyngeal bones separated.

DIVISION I. ACANTH. PERCIFORMES.

Body compressed, elevated or oblong, not elongate. No prominent anal papilla: no superbranchial organ. Dorsal fin, or fins occupying the greater portion of the back, spinous dorsal generally with stiff spines; the soft anal similar to the soft dorsal, of moderate extent or rather short. Ventrals thoracic, always present, with one spine at least and four or five rays.

FAMILY I. PERCIDÆ.

Body compressed or oblong; one or two dorsal fins, the spinous part always well developed. Soft dorsal and anal fins similar, generally a lateral line, lower pectoral rays branched: vertical fins not scaly.

Group *Percina.*

Genus LATES, Cuv.

Seven branchiostegals; pseudobranchiæ. Teeth villiform, without canines; teeth on the palatine bones, tongue smooth.

Two dorsal fins. Operculum spiniferous; præoperculum wit strong spines at the angle and at the lower limb; præorbit strongly serrated. Scales moderate.

Nile, mouth of large East Indian Rivers, and Australia.

1. Lates calcarifer, Bl.

Gunth. Cat. Fishes I., p. 68.—*Lates nobilis*, Cuv. & Val.

D. 7-8. 1/12. A. 3/8-9.

Angle of præoperculum obtuse, the lower limb with four stron spines; coracoid with six to ten denticulations; the third spine anal fin twice as long as the second. Back and sides brownis shining: belly white.

A large fish, found on the coasts and at the mouths of rive in India, China, Java, &c., and probably all over the intertropic coasts of Australia, as Dr. Gunther has seen it from the Fitz River, and Count Castelnau mentions it among the Fishes of t Norman River. Proc. Linn. Soc. N.S. Wales, vol. iii., p. 42.

2. Lates colonorum, Gunth.

Ann. & Mag. Nat. Hist. 1863. p., 114. *Perch of Colonists.*

D. 8. 1/10. A. 3/8. L. lat. 55. L. transv. 8/21.

Body slightly compressed; the height a little more than o third of the length without caudal. Head one-third of the len without caudal. Eyes large, yellow, distant from the point the snout about one diameter, and more than a diameter ap Teeth minute, villiform, the palatine bands narrow and separ from the vomerine band. Maxillary broad, triangular, reachi to below the middle of the eye; mouth slightly oblique, p operculum strongly toothed, six or seven of the teeth at and bel the angle being large and pointed forwards, operculum wit very long acute spine at its extremity. Infraorbital fin serrated and slightly sinuate, the suture of the sub and int operculum elevated into a sharp ridge. Dorsal fins continuous, the fourth spine the longest; third anal spine a little longer than the second; caudal slightly emarginate. Lateral line slightly curved, and occupying 51 scales. Colour silvery, darker on the back.

The continuity of the dorsal fins ought to remove this species from this genus. It is found in all the Eastern rivers of New South Wales, and in some of those of Victoria, and attains a considerable size.

3. LATES SIMILIS, Casteln.

Proc. Zool. Soc., Victoria, Vol. I., p. 44.

This species differs from *L. colonorum* in having the snout shorter, and less than the diameter of the eye, the denticulations of the præoperculum are larger, and those of the lower limb are directed backwards. The second dorsal has only nine rays. Found in the Gippsland Lakes.

4. LATES ANTARCTICUS, Casteln.

Proc. Zool. Soc., Victoria, Vol. I., p. 44.

Sea Perch of the Melbourne Market.

This species, which I have never seen, seems to differ from *L. colonorum* in being of a higher form, in having the præorbital more finely serrated, and the præoperculum more strongly toothed on the posterior edge. The colour is silvery with the back and upper parts of the head of a dark blue; dorsal and caudal fins blackish; ventrals and pectorals of a dark greenish-gray, anal of a light grey.

This Fish is occasionally seen in the Melbourne Market and is esteemed for food.

5. LATES VICTORIÆ, Casteln.

Proc. Zool. Soc. Victoria, Vol. I., p. 45.

This species differs from the last in having the second spine of the operculum composed of a bunch of four spines, of which the two central ones are the largest. The lateral line has two ver strong sinuosities, one opposite to the commencement of the fir dorsal, the other to its end. The body is very silvery, with th back of a light green, showing on the living specimen seven o eight longitudinal lines of a rather darker tinge, the sides an belly have a rosy hue, the side of the head is somewhat purple the fins are of a purplish green and the eyes yellow. Attains length of 16 inches, and like the last is occasionally seen in th Melbourne Fishmarket.

6. Lates curtus, Casteln.

Researches on the Fishes of Australia, p. 5.

Differs from *L. colonorum* in being shorter and higher in th body, in having the maxillary bilobed anteriorly, and in havin 11 rays in the soft dorsal. The third spine of the dorsal is th longest, there are 53 scales on the lateral line, and the transvers line consists of 10/17. Colour uniform, and length of specime 14 inches. Found in the Richmond River.

7. Lates Darwiniensis, Macleay.

Proc. Linn. Soc., N.S. Wales, Vol. II., p. 345.

Port Darwin.

8. Lates Ramsayi, *n. sp.*

D. 9. 1/10. A. 3/7. L. lat. 54.

Compressed, the height of the body one-third of the total lengt length of head about one-fourth ; diameter of eye one-fourth the length of the body, about equal to the length of the snou and rather more than the width of the interorbital space, whi is moderately flat and grooved. Cleft of mouth oblique, t lower jaw longest ; the maxillary broad and truncate reaching below the middle of the orbit, teeth numerous, minute and villifor in both jaws, those on the vomer and palatine bones on elevat ridges ; præoperculum finely serrated on the posterior limb, wit a number of rather strong teeth on the angle and lower limb, those on the latter pointing forwards; infraorbital serrated. Operculum with the lower spine long and sharp. Dorsal fins not quite separate, the first spine very short, the second half the length of the third, that and the fourth, fifth, and sixth about equal; caudal fin a little emarginate. Of an almost uniform pale pearly colour with the tip of the lower jaw, a patch on the edge of the operculum between the spines, and the dorsal, caudal, and ventral fins blackish.

This species was got in the Parramatta River. It is quite distinct from *L. colonorum*, and yet in many respects resembles it extremely closely.

Genus PSEUDOLATES, All. & M'Leay.

A genus separated from *Lates* on account of the villiform teeth on the tongue and large scales.

9. PSEUDOLATES CAVIFRONS, All. & M'Leay.

Proc. Linn. Soc., N. S. Wales, Vol. I., p. 262.

Torres Straits, Port Darwin.

Genus PSAMMOPERCA, Rich.

Seven branchiostegals; teeth on the vomer and palatine bones, crowded, granular; no canine teeth, tongue smooth. Two dorsals slightly continuous moving in a scaly sheath, the first with eight spines, anal with three spines. Operculum with a small and præoperculum with a strong spine, the latter with an entire lower limb. Scales rather large. East Indian and Australian seas.

10. PSAMMOPERCA WAIGIENSIS, Cuv. & Val.

Psammoperca datnioides, Richardson.

Voy. Erebus and Terror, Fishes, p. 116, pl. 57, f. 1-2.

D. 8. 1/12-13. A. 3/9. L. lat. 50-55.

Height of body one-fourth of total length. Hinder edge præoperculum denticulated, a long spine at the angle.

North Australia.

11. PSAMMOPERCA MACROPTERA, Gunther.

Cat. Fishes, Brit. Mus., Vol. I., p. 69.

D. 8. 1/12-13. A. 3/13.

Height of body one-third of the total length, præorbital a suborbital arch strongly serrated, hinder edge of praeopercul serrated, a triangular spine at the angle.

Dr. Gunther gives Victoria, Australia, as the habitat of t very distinct species, he must mean I think the Victoria Riv North-west Australia.

Genus MICROPERCA, Casteln.

Teeth numerous and sharp, disposed in several rows on b jaws and on the palatines, no canines, tongue smooth; opercul and præoperculum not serrated, entire, the former with t feeble points of which the lower one is much larger than t other; the præorbital very finely serrated; two dorsals, alm continuous, the first triangular, with eight spines; caudal round Anal with three spines; scales large. Form oval, rather hig head attenuated; body compressed; no scales on the upper p of the head or snout; no scaly sheath for the dorsals.

Australia.

12. MICROPERCA YARRÆ, Casteln.

Proc. Zool. Soc., Victoria, Vol. I., p. 48.

Height three times and a quarter in the total length, hea four times and one-fifth in the same, eye four and a-quarter i the length of the head. Twenty scales on the lateral line, an twelve on the transverse. Eight strong spines in the first dors fin: the first short, the second and third the longest and nearly equal. the second dorsal has one long, straight spine and eight rays, gradually increasing in length; the anal is like the second dorsal. Scales large; mouth protractile. Colour variable, in some the back is of a purple-grey with the belly and fins yellow, in other specimens the back is green and the belly white with a black longitudinal spot on its lower part, the fins are of an orange colour bordered with black, the ventrals entirely of that colour; the body has more or less black spots; the eye is silvery. Average length from 2½ to 3 inches.

Yarra River, in brackish water.

In accordance with Count Castelnau's views I place this Fish near *Psammoperca*, but I suspect its affinity is more to the *Apogonina*.

Genus ENOPLOSUS, Lacep.

Body and vertical fins greatly elevated. Seven branchiostegals. All the teeth villiform without canines, teeth on the palatine bones and on the tongue. Two dorsals; operculum without spine; præoperculum serrated and with spinous teeth at the angle. Scales moderate. Australian seas.

13. ENOPLOSUS ARMATUS, White.

Voy. N. S. Wales, pl. 39, fig. 1. Gunth. Cat. Fishes, I., p. 81.

"Old Wife" of the Sydney Fshermen. "Bastard Dorey" of the Melbourne Fishmarket.

D. 7. 1/14-15. A. 3/15. Cœc. pylor. 15. Vert. 25.

Upper profile of head very concave, body one half as high as long, much elongate and pointed. White, with eight black transverse bands.

East and South coasts of Australia.

Group *Serranina.*

Genus CALLANTHIAS, Lowe.

Six branchiostegals. Teeth villiform, with canines in both j teeth on the palatine bones, tongue smooth. One dorsal eleven spines, the anal fin with three, operculum spinife præoperculum entire. A part of the fins elongate. S moderate.

Madeira and Tasmania.

14. CALLANTHIAS ALLPORTI, Gunth.

Ann. and Mag. Nat. Hist., 1876, Vol. XVII., p. 390.

D. 11/10. A. 3/10. L. lat. 46.

"The height of the body is one third, and the length of the one fourth, of the total length (without caudal). Eye l than the snout, two-seventh of the length of the head, sit far below the upper profile. The maxillary does not exte below the middle of the eye. Cleft of the mouth oblique, the lower jaw slightly projecting, some of the lower ca horizontally projecting forwards. Præorbital very narrow. lateral line ascends from its origin towards the third dorsal and runs close to the upper profile, the scales above it minute. The scales on the head advance nearly to the end snout; vomer with a transverse series of very strong conical a short patch of small teeth on the palatines, tongue sm Dorsal spines slender, gradually increasing in length, th being as long as the head without snout. The soft dorsa anal high. Caudal emarginate. Pectoral broad, rather al than the ventral, which extends to the vent. Uniform re (in spirits)."

Described from two specimens, 9½ inches long, sent b Morton Allport to the British Museum, from Tasmania.

Genus Breviperca, Casteln.

Teeth small, rather arched, disposed in numerous series, those of the lower jaw directed backwards, a few feeble teeth on the palatines, no canines. Præoperculum rounded, finely denticulated behind and weakly crenulated below. Operculum terminating in a blunt point. One dorsal with eight spines and eleven rays. Scales large.

Australia.

15. Breviperca lineata, Casteln.

Researches on the Fishes of Australia, p. 6.

D. 8/11. A. 3/8. P. 16.

Body short, high. Head large, the maxillary reaches to below the posterior edge of the orbit. Eye large. Dorsal spines low, increasing in length as they go backwards, the rays are much longer. The third anal spine is the longest, the second the thickest. Colour silvery, with two transverse dark bands on the head and in front, another on the cheek, and six broad longitudinal ones on the body.

Swan River, Length of specimen nine inches.

Genus Anthias, Bl.

Seven branchiostegals. Teeth villiform, with canines in both the jaws, teeth on the palatine bones; tongue smooth or with small teeth. One dorsal, generally with ten spines; the anal fin with three. Caudal forked, generally one or several of the fins very elongate. Operculum spiniferous, præoperculum serrated. Scales *moderate*.

The warm seas of all parts of the world.

16. Anthias rasor, Richards.

Serranus rasor, Rich., Trans. Zool. Soc., 1849, p. 73, pl. 4, f. 1. Gunth. Cat. I., p. 93.

Cæsioperca rasor, Casteln., Proc. Zool. Soc., Victoria, I.,

D. 10/21. A. 3/9. L. lat. 54. L. transv. 4/18. Cæc. py

Caudal fin forked, but none of the fins elongate, the one fourth of the total length; the lower portions of densely covered with scales; the height of the body form third of the total length; the head short forming one f it. Shining reddish brown, with a bluish stripe from the eye along the lateral line, and a subvertical oval, spot below the lateral line, opposite the commencemen soft dorsal.

Victorian and Tasmanian seas.

The generic name *Cæsioperca* was given to this species Castelnau, on account of a slight departure from the mor form of *Anthias*. There is scarcely sufficient reason I t the establishment of a new genus.

17. Anthias Richardsonii, Gunth.

Proc. Zool. Soc., 1869, p. 429.

D. 10/20. A. 3/9. L. lat. 60.

Differs only from the preceding species, *A. rasor*, i the blackish spot on the side below the lateral line, of a hor ovate shape, and under the fifth to ninth dorsal rays.

Tasmania.

18. Anthias longimanus, Gunth.

Cat. Fishes I., p. 94, pl. 7, fig. B.

D. 10/20. A. 3/8. L. lat. 65.

The height of the body is four times and three-fourt total length. Caudal fin forked; the pectoral elongate, to the vertical from the soft portion of the dorsal fin, fourth of the total length; head entirely scaly; fins co the greater part with scales. Vomerine teeth in a quadrangular patch. Coloration uniform red.

Port Jackson.

Genus Neoanthias, Casteln.

Seven branchiostegals, teeth villiform, without canines in either jaw, but with an outer line of larger teeth in front; teeth on the palatine bones and on the tongue. One dorsal fin with ten spines, anal with three. Operculum with two flat spines, præoperculum finely and equally serrated, scales large; no denticulations on the præorbital; some of the pectoral rays elongate.

Australia.

19. Neoanthias Guntheri, Casteln.

Pro. Linn. Soc., N.S. Wales, Vol. III., p. 367.

A full description is given by Count Castelnau, *(loc. cit.)* of this beautiful fish, which is occasionally taken outside the heads of Port Jackson.

Genus Serranus, Cuv.

Seven branchiostegals. Teeth villiform, with very distinct canines in both jaws; teeth on the palatine bones; tongue smooth. One dorsal fin, mostly with nine or eleven, rarely with eight, ten or twelve spines; anal fin with three. Operculum with two or three acute points; præoperculum more or less serrated, *without* spinous teeth on the lower limb. Scales *small.*

Temperate and Tropical seas.

20. Serranus australis, Casteln.

Researches on the Fishes of Australia, p. 7.

D. 11/13. A. 3/8.

Body compressed, ovate, rather high, with the anterior profile very acute; lower jaw longer than the upper; caudal fin rounded

rather pointed; dorsal and anal fins high; the opercul
strong point, and its membranous portion extends
behind this; over this is a strong notch. Canines sma
brownish-black entirely covered with rather minute,
rounded white spots. Length of specimens five to six

Cape York and Darnley Island.

21. SERRANUS STIGMOPOMUS, Richardson.

Ichth. China, p. 232. Gunth. Cat. I., p. 11

D. 9/17. A. 3/8.

Caudal fin rounded, præoperculum finely serrated,
stronger denticulations at the angle. Brown, with ei
darker cross bands; a round black spot between the
opercular spines; dorsal fin with a pale edge, pector
fins with a dark one.

North West Coast of Australia.

This is identical with the *Epinephelus bœlang* of Ble
Serranus bœnak, of Cuv. & Val., Bleek., Gunth., and
with *Serranus nigrofasciatus* of Homb. Jacquin, Voy.
Poiss., p. 36, tab. 2, fig. 1. It has a very wide
throughout the Indian seas.

22. SERRANUS PACHYCENTRUM, Cuv. & Val

Gunth. Cat. I., p. 116.

D. 9/15. A. 3/8.

Caudal fin rounded, both limbs of the præoperculum
limbs of the inter and suboperculum finely denticulat
scales each with a slight keel, forming together
lines. Colour uniform light brown in spirits.

Port Darwin; one specimen four inches long.

23. SERRANUS GUTTATUS, Bl.

Gunth. Cat. I., p. 113.

D. 9/16. A. 3/9.

Caudal fin rounded; denticulations of the præoperculum obsolete, its posterior limb not emarginate. Brownish black; head, body, and all the fins with round, blue, black-edged spots, the caudal, anal, and hinder half of the dorsal fins white-edged.

North Coast of Australia.

A species of wide range throughout the South and Indian Seas. Indentical with *S. myriates* of Cuv. & Val., and other authors, and according to Dr. Bleeker, the same or a variety of his *Serranus Argus*.

24. SERRANUS OUATALIBI, Cuv. & Val.

Gunth. Cat. I., p. 120.

D. 9/15. A. 3/9. L. lat. 85. Cæc. pylor. 8. Vert. 10/14.

Caudal fin rather truncated; sub and inter-operculum slightly denticulated at their junction; præoperculum serrated, teeth of the angle not prominent, lower limb entire; the upper spine of the operculum largest and longest. Maxillary bone not reaching to the level of the hinder edge of the eye; diameter of the eye 5¼ in the length of the head; length of the head 3½ in the total. Red: head and body, and sometimes dorsal fin covered with numerous small, blue, black-edged spots; a pair of larger black spots on the symphysis of the lower jaw, and another on the back of the tail behind the dorsal.

Lord Howe's Island.

This is a species of the West Indies and tropical Atlantic, but is stated on the authority of Dr. Gunther, as having been taken at Lord Howe's Island on one of the voyages of H.M.S. "Herald" to that Island. I suspect it will prove to be a different species.

25. SERRANUS FUSCOGUTTATUS, Rupp.

Gunth. Cat. I., p. 127.

D. 11/14-15. A. 3/8-9.

Caudal fin rounded; denticulations of the præoperculum stronger at the angle; light brown, marbled with darker and covered with rounded blackish-brown spots; a large black blotch behind the dorsal fin across the back of the tail.

North and North-east Coasts.

Identical with *S. horridus*, Cuv. & Val., and *S. dispar*, Playfair.

26. SERRANUS CORALLICOLA, Cuv. & Val.

Serranus altivelioides, Bleek., Gunth. Cat. I., p. 127.

D. 11/15. A. 3/8. L. lat. 86.

Caudal fin rounded; the length of the head is three times and one-fifth in the total length; diameter of the eye one-fifth of the length of the head; the upper profile of the head rather convex; sub and inter-operculum entire. Yellowish; head, body, and all the fins with small round brown spots.

North-west Coast. Port Darwin.

27. SERRANUS MARGINALIS, Bl.

Gunth. Cat. I., p. 135.

D. 11/15-16. A. 3/8. L. lat. 80-90. Vert. 9/15.

Caudal fin truncated. Length of the head twice and one-third in the total; diameter of the eye four times and two-thirds in the length of the head. Præoperculum with rather stronger denticulations on the angle, sub and inter-operculum entire. The maxillary bone reaches to the level of the posterior margin of the eye. Pectorals distant from the anal and reaching a little behind the tip of the ventrals. Colour brownish or yellowish; the spinous part of the dorsal fin, and sometimes the caudal fin black-edged.

Darnley Island.

ker makes this species to be identical with his *Epinephelus* If so, the fresh specimens are distinctly marked with en short brown fasciæ on the back. It is also identical *ceanicus* of Cuv. and Val. It is widely distributed t the Indian and Chinese Seas.

28. **Serranus diacanthus**, Cuv. & Val.

Gunth. Cat. I., p. 110.

D. 11/15-16. A. 3/8. L. lat. 90.

fin rounded; eye nearly one-fifth of the length of the gth of the head one-third of the total; sub and inter- entire; the inferior limb of the præoperculum entire arge spines at the angle and the posterior limb strongly ed. Colour light bluish-grey, with fins dark brown, rather irregular cross bands, and a number of round on the body.

ork. (Castelnau).

29. **Serranus crapao**, Cuv. & Val.

Gunth. Cat. I., p. 137.

D. 11/15. A. 3/8. L. lat. 80.

in rounded; head one-third of the total length; diameter one-seventh of the length of the head, angle of the lum with stronger denticulations; sub and inter- entire. Brownish, all the parts with rounded brown

sington, Torres' Straits.

pantherinus, *maculosus*, *bontoo*, and *suillus*, of Cuv. and he same as this species.

30. **Serranus Damelii**, Gunth.

Mag. Nat. Hist., 1876, fourth series, Vol. XVII., p. 391.

Rock Cod " of the Sydney Fishermen.

A good description of this species is given by Count Cast at page 365 of the third volume of the Proceedings o Linnean Society of New South Wales.

East Coast, N. S. Wales.

31. **Serranus alatus**, All. & Macl.

Proc. Linn. Soc., N.S. Wales, Vol. I., p. 264, pl. 4, fig.

South Coast New Guinea, ("Chevert" Exp.)

32. **Serranus carinatus**, All. & Macl.

Proc. Lin. Soc., N. S. Wales, Vol. I., p. 265, pl. 4, fig.

Torres' Straits, ("Chevert" Exp.)

33. **Serranus guttulatus**, Macl.

Proc. Linn. Sc., N. S. Wales, Vol. III., p. 33, pl. 2.

Port Jackson.

34. **Serranus undulato-striatus**, Peters.

Monatsber, Ak. Wiss., Berlin, 1866, p. 518.

Described by Count Castelnau in Proc. Linn. Soc., N. S. Vol. III., p. 366.

It is very likely I think to be the same as the preceding sp but the descriptions do not tally.

Port Jackson.

35. **Serranus hexagonatus**, Cuv. & Val.

Gunth. Cat. I., p. 140.

D. 11/15-17. A. 3/8. L. lat. 80.

Caudal fin rounded. The length of the head is three time one-third to three and a-half in the total; diameter of th nearly one-fifth of the length of the head, and larger tha distance between the eyes. The upper maxillary bone re beyond the level of the posterior margin of the eye. The angle of the præoperculum with stronger spinous teeth; sub and inter-operculum entire; the pectoral fin reaches as far as the ventral—that is, not to the vent. Brownish, covered all over with large rounded or hexagonal spots.

North and East Coasts.

A species of very wide range and identical with *S. stellans* and *foveatus*, of Cuv. & Val Dr. Gunther considers *S. merra* a mere variety of *hexagonatus* Dr. Bleeker regards them as distinct species. We have both in Australian waters.

36. SERRANUS GILBERTI, Richards.

Gunth. Cat. I., p. 148.

D. 11/16-17. A. 3/8-9. L. lat. 75-80.

Caudal fin rounded; length of head three times and a-half in the total length; the diameter of the eye four times and two-thirds in the length of the head, larger than the distance between the eyes, but equal to the distance of the eye from the end of the snout. Pectoral fins very large, nearly equal to the length of the head, and reaching to the commencement of the anal fin, the maxillary bone reaches beyond the level of the posterior margin of the eye. Præoperculum finely serrated, with stronger denticulations at the angle; sub and inter-operculum entire. Brownish, all parts with large, rounded, dark-brown spots; behind the maxillary bone a black streak.

North and North-east Coast. Torres' Straits.

Identical with *S. megachir*, Richards, and *Epinephelus pardalis*, Bleeker, Atlas Ichthyol. Perc. tab. 53, fig. 3.

37. SERRANUS ALTIVELIS, Cuv. & Val.

Gunth. Cat. I., p. 152.

Cromileptes altivelis, Bleek., Atlas Ichthyol. Perc., tab. 44, fig. 3.

D. 11/18-19. A. 3/9-10.

Caudal fin rounded ; dorsal and anal fins much elevated ; uppe profile of the head concave. Præoperculum finely and equall serrated. Yellowish, all parts with distant round black spo edged with white.

Port Essington.

38. SERRANUS ARMATUS, Casteln.

Researches on the Fishes of Australia, p. 7.

I give Count Castelnau's description of this Fish in full. It i clearly not a *Serranus*.

"It is with doubt that I make a *Serranus* of this fish, o account of its dentition. The general form is short and high; th head is contained a little over three times in the total length, an the diameter of the eye four and a-half times in the length of th head; the height of the body is about equal to the length of th head; the teeth are small and villiform on both of the jaws, a on the upper one there are two strong canines on each side i front; on the lower jaw there are two similar canines, and a about half-way to the junction with the upper jaw there i another strong canine; the teeth of the palate are small bu numerous. There are no scales on the maxillary bone; the hea is covered with minute scales; the præopercule is rounded an finely denticulated; the denticulations are rather stronger on th lower edge, and slightly directed forward; the opercule has strong, flat spine at its posterior angle; the scales of the bod are of moderate size, three or four times larger than those of th head; the lateral line runs over about seventy transverse scale and these number about thirty-five on the transverse line; the scales are ciliated on the posterior edge; the dorsal fin is forme of ten spines and twenty rays; the soft portion of this fin is high than the other, and the membranes uniting the rays are cover with scales; caudal large, contained less than six times in t total length; it is slightly concave; the anal has three spines of moderate size, the third being the longest; it has seven soft rays; the ventrals are a little in front of the pectorals, or on the line of the upper part of their insertion; the pectorals are rather longer than the caudal, and formed of sixteen rays; all the fins are scaly. The colour is uniform, of a reddish-yellow, probably orange; the fins are more red; the extremity of the fins, and the upper part of the head, are dark; no spots or bands. Length of specimen over eleven inches. Form of *Sebastes*. Swan River."

Serranus lepidopterus, as described by Richards, (Ann. and Mag. Nat. Hist., 1842, Vol. IX., p. 18.) cannot I think be a *Serranus* at all, his description is taken only from a drawing made by a convict at Port Arthur, Tasmania, and is in all likelihood incorrect.

Genus PLECTROPOMA, Cuv.

Like *Serranus*, but with spinous teeth directed forwards on the lower limb of the præoperculum.

Tropical Seas.

39. PLECTROPOMA MACULATUM, Bl.

Gunth. Cat. I., p. 156. All. & Macl., Proc. Linn. Soc., N. S. Wales, Vol. I., p. 265. Bleek., Atlas Ichth. Perc. tab. 13, fig. 3.

D. 8/10-11. A. 3/7-8. L. lat. 110. Vert. 10/14.

Præoperculum exceedingly finely serrated behind, with three spinous teeth below; sub and inter-operculum entire. Caudal fin truncate in young specimens, in older ones emarginate. Red: head, body, and vertical fins with blue spots, those of the head and of the front part of the body oblong, elliptical, arranged in irregular longitudinal rows, the others circular and smaller.

Fair Cape. ("Chevert" Exp.)

40. PLECTROPOMA LEOPARDINUM, C. & V.

Gunth. Cat. I., p. 157. Bleek. Atl. Ichthyol. Perc. t. 18, f. 3.

D. 8/10-11, vel. 7/11-12. A. 3/7-8. L. lat. 120.

Præoperculum minutely serrated behind. with five s teeth beneath, the three lowest close together. Caudal fin sl emarginate. Colour brownish-red, with numerous, small blue spots on the head, body, vertical fins and base of the pec tail with a yellow posterior edge.

North Australia.

41. Plectropoma nigrorubrum, Cuv. & Val.

Gunth. Cat. I., p. 158. Voy. Astrol. Poiss., pl. 4. fig.

D. 10/17-18. A. 3/8. Cæc. pylor. 8.

Caudal fin truncated. Præoperculum finely serrated b with two strong spinous teeth below, one of them at the Colour reddish-yellow, with five black cross bands.

West Australia.

42. Plectropoma annulatum, Gunth.

Gunth. Cat. I., p. 158.

An excellent description of this species is given by Castelnau in his Paper on the Fishes of Port Jackson in 369, of Vol. III., of the Proceedings of the Linnean Soci New South Wales.

43. Plectropoma semicinctum, Cuv. & Val.

Gunth. Cat. I., p. 160.

D. 10/18-20. A. 3/7-8. L. lat. 45.

Præoperculum finely serrated behind, with three equal s teeth below, one of which is at the angle. Caudal fin tru Red, with eight brown cross bands, lost on the sides. Si the head with indistinct brownish streaks.

Swan River; Port Jackson.

44. PLECTROPOMA SUSUKI, Cuv. & Val.

Gunth. Cat. I., p. 160. Proc. Zool. Soc., 1867, p. 100.

D. 11/14. A. 3/8. L. lat. 110.

Caudal fin truncate, one sixth of the total length, præoperculum finely serrated behind, with from two to five larger teeth on the lower limb. Dorsal fin rather elevated, without notch. Colour brownish-grey, with eight or nine darker cross-bands.

Port Jackson. (Gunther).

45. PLECTROPOMA DENTEX, Cuv. & Val.

Gunth. Cat. I., p. 160. Richards, Voy. "Ereb. and Terr.," pl. 57, fig. 3-5.

D. 10/18. A. 3/8. Cæc. pylor. 7.

Præoperculum with a few inconspicuous denticulations behind, and three or four small spinous teeth below. Caudal fin rounded. Olive, marbled with blackish; black spots on the sides of the head, and on the snout.

King George's Sound.

46. PLECTROPOMA OCELLATUM, Gunth.

Brench., Cruise of the "Curaçoa," p. 416, pl. 29.

Plectropoma cyanostigma, Gunth. Cat. I., p. 161.

D. 13/15. A. 3/8. L. lat. 100.

The height of the body is nearly equal to the length of the head, and two-fifths of the total (without caudal); præoperculum with three spines beneath, the anterior of which is the strongest and sometimes bifid. Brownish: head, body, and base of the fins with numerous roundish spots, bluish in the centre, and black round the margin; they are more numerous, and also relatively smaller in old examples than in younger ones, those on the head and fins without bluish centre.

Port Jackson. Australian Seas.

Gunth. Cat. I., p. 162.

D. 13/15. A. 3/9. L. lat. 100.

Height of body three times and one-third in the total leng
length of the head is one-third of the same. Præope
strongly serrated, with three large spinous teeth on the
limb, the anterior of which is the strongest. Caudal fin
rounded. Reddish brown, with six dark brown cross
encircling the body and tail: sides of the head with two
of the same colour from the eye to the opercles, fins black,
edged.

Norfolk Island.

48. Plectropoma serratum, Cuv. & Val.

Gunth. Cat. I., p. 163. Dum. D'Urv. Voy. Pole Sud., pl. 3

D. 13/16. A. 3/9. Cæc. pylor. 8.

Præoperculum strongly serrated behind, with two large
teeth below, the anterior one strongest. Caudal fin tr
Brown; an oblique blackish band from the eye to the
the præoperculum, and some black spots on the sides of th

King George's Sound.

49. Plectropoma Richardsonii, Gunth.

Proc. Zool. Soc., 1861, p. 391, pl. 38.

D. 10/18. A. 3/8. L. lat. 105.

This species seems to differ from *P. dentex* chiefly in
The dentition is very strong, the præoperculum is rounded,
serrated posteriorly, and with one small spine pointing fo
in the middle of the inferior limb. Caudal fin truncate.

part of the head, cheeks, back of the trunk, and the spinous dorsal, bright red, the remainder of the fish yellow, with a very broad, irregular, brown band from the axil to the lower half of the caudal. Irregular small blue spots, mostly edged with brown are scattered over the head and upper parts of the body, and some large dark brown spots on the brown band. Fins immaculate, except the spinous dorsal, which has a few small blue spots.

Freemantle, West Australia.

50. PLECTROPOMA VARIEGATUM, Casteln.

Researches Fishes of Aust. p. 7.

"Lateral line continued on the caudal fin; teeth rather long, conical, sharp, distant one from the other, with a second and internal series of others almost similar, forming two bunches in front; two very large canines in front of each jaw; a transverse line of very fine teeth on the palate and vomer having the form of a V; mouth very large; præoperculum very finely serrated behind with three strong notches beneath; one dorsal formed of a low spinous portion with seven spines, and of a soft one much higher, having one spine and seven rays; the caudal is strongly emarginate; the anal is formed of three feeble spines and of seven rays; scales of the body very small; the general colour is brown, covered with darker transverse narrow lines; similar lines are disposed obliquely on the cheeks and on the opercles; the fins are spotted with black; the pectorals are black, with their posterior third white. Fifteen inches long. Cape York."

Genus TRACHYPOMA, Gunth.

Like *Plectropoma*, but without canine teeth.

Pacific.

51. TRACHYPOMA MACRACANTHUS.

Gunth. Cat. I., p. 167, pl. 13, fig. B.

D. 12/14. A. 3/6. L. lat. 65. Cæc. pylor. 13.

Height of body three times and a-half in the total length, the length of the head is one-third of the same. Posterior limb of præoperculum strongly denticulated, the inferior with three strong spinous teeth, the anterior of which is the largest; sub and interoperculum entire. Brownish (in spirits), covered all over with very small whitish, darker-edged specks.

Norfolk Island.

Genus GRAMMISTES, Cuv.

Seven branchiostegals. Teeth villiform, without canines, teeth on the palatine bones, tongue smooth. Two dorsals, the first with seven spines. Anal spine none. Operculum and præoperculum spiniferous without serrature. Scales minute, enveloped in the epidermis.

Indian Seas.

52. GRAMMISTES ORIENTALIS, Bl.

Gunth. Cat. I., p. 171.

D. 7. 1/13. A. 0/8.

Body oblong, compressed; caudal fin rounded. Præoperculum with three spines, tendril rudimentary. Black or blackish-brown, generally with six or seven whitish longitudinal bands.

North Australia.

Genus DIPLOPRION, Cuv. & Val.

Seven branchiostegals. Teeth villiform without canines, teeth on the palatine bones, tongue smooth. Two dorsals, the first with eight spines. Anal with two. Operculum spiniferous, præoperculum with double denticulated limb. Scales small.

Indian Seas.

53. DIPLOPRION BIFASCIATUM, Cuv. & Val.

Gunth. Cat. I., p. 174. Bleek. Atl. Ichth., Perc., tab. 68, fig. 3.

D. 8. 15. A. 2/12. Vert. 12/13. Cæc. pylor. 3.

Body twice and a-half as long as high, compressed; the first dorsal fin half as high as trunk; ventrals long, pointed. Yellowish with two broad black cross bands.

Port Darwin.

Genus MYRIODON, Bris. de Barnev.

Seven branchiostegals. Teeth minute; villiform teeth on the palate; tongue smooth. One dorsal, with twelve or thirteen spines; anal fin with three. Operculum spiniferous; præoperculum denticulated, with spinous teeth on the lower limb, directed forward. Scales *moderate*. Pyloric appendages small or none.

North Australian Seas.

54. MYRIODON WAIGIENSIS, Quoy. & Gaim.

Gunth. Cat. I., p. 175. Bleek. Atl. Ichth. Perc., tab. 19, fig. 1·

D. 12-13/9-12. A. 3/5. L. lat. 42. L. trans. 8/17. Vert. 9/16.

Height of body one-third of total length, and equal to the length of the head, the diameter of the eye is one-third of the latter. On each side between the two nasal openings is a short membranaceous appendage. Præoperculum with three or four spinous teeth beneath, directed forward; operculum with a single spine. Caudal fin very slightly emarginate: the second spine of the anal very long and strong. Greyish, marbled with grey and brown.

Port Essington. Port Darwin.

Genus GENYOROGE, Cuv.

Seven branchiostegals. Teeth villiform with canines in both jaws, teeth on the palatine bones, tongue smooth. One dorsal with ten or eleven, rarely with more spines; anal fin with three. Operculum with two or three points; above the angle of the præoperculum, a deep notch, as deep as broad, receiving a more or less spinous knob of the inter-operculum. Scales moderate.

Indian Seas and West Pacific Ocean.

55. GENYOROGE SEBÆ, Cuv. & Val.

Gunth. Cat. I., p. 176. Bleek. Atl. Ichth. Perc., tab 72,

D. 11/16. A. 3/9-11. L. lat. 40. Cæc. pylor. 4. Vert. 10/

Head one-third of the total length, equal to the height body; the diameter of the eye is four times and a-half i length of the head; præoperculum serrated behind and b caudal fin emarginate. Colour yellowish, with three l blackish (reddish violet) cross bands.

North Australia. Percy Islands.

56. GENYOROGE BENGALENSIS, Bl.

Gunth. Cat. I., p. 178. Bleek. Atl. Ichth. Perc. tab 55, f

D. 10/15-16, vel. 11/14-15. A. 3/8-9.

The length of the head is equal to the height of the bod three times and a-half in the total length; the diameter eye is three times and a-half in the length of the head. operculum denticulated behind and below. Caudal fin emarg Colour yellowish, on each side four or five blue longitudinal l

Port Jackson. (Casteln. Fishes of Port Jackson).

57. GENYOROGE UNICOLOR, All. & Macl.

Proc. Linn. Soc., N.S. Wales, Vol. I., p. 266, pl. 4, fig.

Percy Islands. (Chevert Exp.)

Genus MESOPRION, Cuv.

A genus not differing from *Genyoroge*, except that the above the angle of the præoperculum is either wanting or sm

All tropical Seas.

58. MESOPRION CARPONOTATUS, Rich.

Ann. and Mag. Nat. Hist. 1842, Vol. IX., p. 28. Gunth. C p. 190.

D. 10/15. A. 3/10. L. lat. 68.

The length of the head is three times and two-thirds in the total length, and equal to the height of the body, the diameter of the eye is four and one-third in the length of the head. Præoperculum with a few scarcely visible denticulations, slightly emarginate; operculum rounded, as in *Sparus*, with a shallow re-entering arc; superscapula entire. Caudal fin truncate; the point of the pectoral falls short of the anus. The fourth dorsal spine longest, the second and third of the anal fin nearly equal. Coloration uniform, with a black spot at the root of the pectoral fin.

North-west Coast.

59. MESOPRION WAIGIENSIS, Quoy & Gaim.

Gunth. Cat. I., p. 191.

D. 10/14. A. 3/9. L. lat. 75.

Height of the body three times and two-thirds in the total length, and equal to the length of the head, the diameter of the eye is four times and two-thirds in the latter. Præoperculum very finely serrated, notch conspicuous, knob rather indistinct. Caudal fin emarginate; pectoral distant from anal fin; the third and fourth dorsal spines longest; the second of the anal stronger but not longer than the third. Colour uniform olive (in a dried state), with indistinct, oblique streaks above the lateral line, and longitudinal ones beneath; base of the pectoral with a narrow black spot.

Port Essington.

60. MESOPRION JOHNII, Bl.

Gunth. Cat. I., p. 200. Bleek. Atl. Ichth. Perc. tab. 60, fig. 3.

Mesoprion unimaculatus, Cuv. & Val., Richards, &c.

D. 10/14. A. 3/8. L. lat. 48.

Height of body three times and a-half in the length, and nearly equal to the length of the head. Notch of præoperculum, and

knob of interoperculum, conspicuous; præoperculum
denticulated above, and more coarsely below the notch;
maxillary bone reaching to below the anterior half of th
Caudal fin slightly emarginate; pectorals not reaching
anal; the third, fourth, and fifth dorsal spines longest, the s
of the anal stronger, but not longer than the third. Yell
with indistinct, oblique streaks above the lateral line,
longitudinal ones beneath; a large oval black spot on the l
line beneath the anterior half of the soft dorsal.

North Australia. Port Darwin.

61. MESOPRION ANNULARIS, Cuv. & Val.

Gunth. Cat. I., p. 204. Bleek. Atl. Ichth. Perc., tab. 23,

SYN.—*chirtah*, Bleek., *rubellus*, Cuv. & Val., *metallicus*, B
sanguineus, Bleek., *erythrinus*, Gunther.

D. 11/13-15. A. 3/8-9. L. lat. 56-60.

Height of body twice and three-quarters in the total lengt
length of the head thrice and a-half, the diameter of the ey
fourth of the latter. Notch and knob of the opercles indis
except in young specimens. Caudal fin truncate; pectorals
to the anal; fourth, fifth, and sixth dorsal spines longes
second of the anal fin much stronger than the third. R
blackish streak from the first dorsal spine to the eye; back
tail with a black, white-edged spot; these marks are not v
in some specimens.

North Australia.

62. MESOPRION VITTA, Quoy & Gaim.

Gunth. Cat. I., p. 207. Bleek. Atl. Ichth. Perc, tab 62, fi

SYN.—*M. enneacanthus*, *phaiotæniatus*, and *Ophusenii* of Blee

D. 10/13-14. A. 3/8. L. lat. 55-62.

Height of body three times and a-half in the length and
to the length of the head, diameter of the eye one-fourth

latter; upper profile of head very slightly concave, notch and knob of opercles conspicuous. The upper maxillary bone scarcely reaches to below the middle of the eye. Caudal fin truncate or very slightly emarginate; pectoral not reaching to the anal; dorsal spines slender, the third and fourth longest; the second and third of the anal about equal in length, the second stronger. Reddish with oblique streaks above, and longitudinal ones beneath the lateral line, a broader blackish band from the eye to the back of the tail, dorsal and caudal fins blackish, the others yellowish; no black spot at the base of the pectoral.

North Australia.

63. MESOPRION SUPERBUS, Casteln.

Diacopus superbus, Casteln., Proc. Linn. Soc., N. S. Wales, Vol. II., p. 228.

Fully described in "*loc. cit.*" Is found in Moreton Bay where it is known as "Red Bass," and is said to be a good table fish.

64. MESOPRION OBSCURUS, *n. sp.*

D. 10/12. A. 3/8. L. lat. 48.

Length of head and height of body alike and one-third of the total length. Upper profile of head straight, eye about its own diameter from the snout, the maxillary scarcely reaching to below the middle of the eye; præoperculum finely serrated behind and only slightly notched. Colour dingy black, with numerous narrow indistinct cross-bands of a lighter hue; fins all more or less blackish excepting the pectorals, tail truncate.

Endeavour River.

65. MESOPRION ROSEIGASTER, *n. sp.*

D. 10/13. A. 3/9. L. lat. about 40. L. tr. 6/15.

Height of body and length of head about equal, and one third of the total length. The diameter of the orbit is nearly one-fifth of the length of the head, the distance from the eye to the snout is equal to two diameters, and the interorbital space to one and a-quarter. The profile of the head is straight, but descends to the snout at an angle of 45°, the height of the præorbital, which is naked, is equal to one and a-half diameter of the eye, the lips are thick, the membrane almost entirely concealing the maxillary bone, which reaches to below the middle of the eye. There are several canine teeth in the lower jaw, no very conspicuous ones in the upper. Præoperculum very slightly notched, and a little jagged about the angle. Scales large on the body, very small on the caudal and soft dorsal and anal fins. The fourth dorsal spine longest; the second anal very strong, not so long as the third; the middle rays of the soft dorsal rather the longest; in the anal the first rays are the longest, giving it a truncate appearance behind; the caudal is slightly emarginate; the pectorals reach almost to the vent, and beyond the extremity of the ventrals. The colour (in spirits) is on the upper parts of the head and body of a bluish silvery hue, with a vertical pearly mark on each scale and on the lower parts of a beautiful rosy pink, (in the fresh state the whole body was more or less pink). Length eighteen inches.

Rockingham Bay.

I am indebted to Mr. Haswell, the Director of the Brisbane Museum, for a specimen of this very beautiful fish, it is said to be from fresh-water.

Genus Neomesoprion, Casteln.

A genus formed by Count Castelnau for a species of *Mesoprion* having only nine spines in the dorsal fin.

66. Neomesoprion unicolor, Casteln.

Researches on the Fishes of Australia, p. 8.

"The body is oval, high; the upper profile strongly convex; the height is contained a little over twice and a-half in the total length without the caudal; the head is twice and two-thirds in the same; the eye is a little over four times in the length of the head, and nearly once and a-half in the snout; the scales on the front part of the head are very minute; those of the opercles as large as those of the body; the opercule is pointed; the dorsal is formed of nine spines, of which the second is the longest, and the others go decreasing in length, and of fifteen rays; the caudal is strongly emarginated; the anal has three spines, and nine rays; the first of the spines is short, and the two others about equal, but no longer than one-half the height of the rays; the pectorals are large and formed of fourteen rays; the lateral line runs over sixty-four scales. The colour, in spirits, seems to have been silvery, with a yellow tinge; the fins yellow. The length of the specimen is eleven inches. Cape York."

Genus GLAUCOSOMA, Temm. & Schleg.

Eight branchiostegals. Teeth carminiform in the jaws, on the vomer and palatine bones; the rest of the mouth and tongue densely covered with very minute villiform teeth. No canines. One dorsal fin, the spinous portion low, consisting of eight spines; anal spines three; præoperculum slightly serrated. Scales ctenoid, those on the body rather large; head entirely covered above and below with small scales. Eye large. Lateral line nearly straight.

67. GLAUCOSOMA HEBRAICUM, Richards.

Voy. "Ereb. & Terr." Fishes, p. 27, pl. 17.

Jew Fish of the Colonists.

D. 8/11. A. 3/9. L. lat. 48. L. transv. 10/20.

The height of the body is three times and a-half in the total length, and nearly equal to the length of the head; the diameter of the eye is one-fifth of the latter, and is about equal to the height of the præorbital bone. The maxillary bone reaches to beneath the posterior third of the eye, and is truncate. T nostrils are large, contiguous, and immediately in front of th eye, the snout entirely scaly, operculum with two flat obtuse lips; suprascapula not visible. Caudal fin truncate with slightly convex angle; the first four or five rays of the dorsal fin longer than the others, the fourth elongate. Back more or less distinctly spotted with black.

West Australia. Length thirty-one inches.

68. GLAUCOSOMA SCAPULARE, Ramsay, (M.SS.)

[Plate 13.]

B. 8. D. 8/11. A. 3/9. L. lat. 50. L. transv. 11/20.

Form oblong, compressed; the height of the body is one-thir of the total length, the length of the head a little less; the ey is very large, the diameter of the orbit being one-fourth of th length of the head, equal to its distance from the extremity the upper jaw, and greater than the width of the interorbit space, which is convex transversely. The nostrils are larg placed immediately in front of the eyes, and almost contiguou the posterior one the largest. Teeth in the jaws short, stron pointed and a little curved, placed in two tolerably regular ro on the edge of the bone, the exterior row in the upper jaw, a the interior in the lower being the largest; teeth of the sa description but smaller on an elevated ridge on the vomer a palatine bones; all the rest of the mouth and the tongue dense clothed with very minute villiform teeth; no canines. T profile of the head descends in a gentle curve to the front of t eyes opposite the nostrils where there is a slight concavity, then bulges out towards the snout, which is truncate at i extremity. The cleft of the mouth is oblique, the lower jaw considerably longer than the upper, but shuts into it, the rath swollen extremity of the lower jaw being received into a toothle space in the centre of the upper. The maxillary bone is larg and triangular, and reaches backwards nearly to the vertical fr the posterior margin of the orbit. Every portion of the head is closely covered with hard, adherent, small ctenoid scales, excepting the truncate space on the snout; the dorsal, caudal and anal fins are also clothed on their basal portions with small scales; the scales on the body are rather large. The præorbital bone has a smooth, straight edge and its height is little more than half the diameter of the orbit; the præoperculum has a well defined central ridge and is broadly rounded and serrated towards the angle; the operculum is without visible point; the coracoid is large, free, and scaly on its lower half; the scapular bone is free, scaleless, covered with a black skin, rounded and crenulated towards the extremity, and very large. The spinous portion of the dorsal fin is low, the eighth spine the longest, but less than half the length of the first rays; the caudal fin is slightly emarginate; the first and second anal spines short, the third more than three times the length of the first spine, and one-half the length of the second ray. Pectoral fins rather short, but extending slightly beyond the ventrals. Colour uniform silvery, each scale on the body seemingly with a black spot, caused by the black skin showing through the base of the scales. Fins immaculate; axil black. Length twenty inches.

Port Jackson.

One specimen of this curious fish was brought to Mr. Ramsay of the Australian Museum a few weeks ago. As far as is known it is unique.

Genus Bostockia, Casteln.

Teeth numerous, small, and villiform on the jaws, vomer and palatine bones, tongue smooth. One dorsal with eight spines, anal with three. Operculum with a bifid spine, præoperculum with spines at its lower edge. Scales small. Head cavernous, without scales.

69. BOSTOCKIA POROSA, Casteln.

Proc. Zool. Soc., Victoria, Vol. II., p. 126.

D. 8/16. A. 3/11.

Upper profile convex, head rather elongate and pointed, low jaw longer than upper. Height of body four and one-third time in the total length, eyes as long as the snout, and four and a-hal times in the length of the head; nostrils large; opercles scaly præoperculum with strong spinous teeth directed forwards on th lower edge, smaller but similar ones on the anterior edge of th upper limb; the third dorsal spine the longest. Caudal fi rounded, the soft dorsal and anal fins having their middle ray longest. Colour uniform dark brown, with the fins black. Lengt of specimen five inches.

Fresh-water in the interior of Western Australia.

Group *Priacanthina.*

Genus PRIACANTHUS, Cuv. & Val.

Six branchiostegals. All the teeth villiform, without canine teeth on the palatine bones, tongue smooth. One dorsal with t spines, anal with three. Operculum with an indistinct poin præoperculum serrated with a more or less prominent, fl crenulated angle. Scales small, rough, snout covered with cten scales. Lower jaw with prominent chin; eye large.

Tropical Seas.

70. PRIACANTHUS MACRACANTHUS, Cuv. & Val.

Gunth. Cat. I., p. 215. Casteln. Proc. Linn. Soc. N. S. Wal
Vol. III., p. 369.
Priacanthus Bleekeri, Casteln., Proc. Zool. Soc. Vic., Vol. II., p. 1

D. 10/13-14. A. 3/14-15. L. lat. 80-85.

A description by Count Castelnau of this species will be fou in page 269 of the third volume of the Proc. Linn. Soc. N.S. Wal

Port Jackson.

71. Priacanthus benmebari, Temm. & Schleg.

Gunth. Cat. I., p. 218.

D. 10/13. A. 3/14. L. lat. 75-80.

The height of the body is three times and a-half, and the length of head three times and two-thirds in the total length, the diameter of the eye is two and three-quarters in the latter. Posterior opening of the nostril elliptical, about twice and a-half as long as broad. Angle of præoperculum slightly obtuse, with a flat, rather elongate serrated spine, operculum with two very small spines; sub and inter-operculum with excessively fine denticulations. Caudal fin truncated, dorsal and anal spines very slender, neither rough nor striated; the last of the dorsal hardly longer than the eighth and ninth, and once and a-half as long as the second; the ventral fins reach to, but are shorter than the anal. Red: dorsal, anal, and ventral fins paler, with round yellow spots.

Sydney (Gunth. Ann. Nat. Hist., 1867, Vol. XX., p. 57).

Group *Apogonina.*

Genus Ambassis, Cuv. & Val.

Six branchiostegals. Teeth villiform, without conspicuously larger canines; teeth on the palatine bones. Two dorsals, the first with seven, the anal fin with three spines, a procumbent spine in front of the dorsal. Operculum without a prominent spine; the lower limb of the præoperculum with a double denticulated edge. Lateral line sometimes interrupted. Scales large, deciduous.

Small fishes living in the fresh and brackish waters of the Indian and Australian regions.

72. Ambassis Commersonii, Cuv. & Val.

Gunth. Cat. I., p. 223. Bleek. Atl. Ichth. Perc., tab 74, fig. 1.

D. 7. 1/9-10. A. 3/9. L. lat. 30-33. Vert. 9/15.

Height of body twice and a-half in the length (without cau second spine of dorsal fin thrice and a-half in the same. Se and third anal spines nearly equal, or third rather longer; la line slightly curved. Coloration of body uniform.

Port Darwin.

73. AMBASSIS AGRAMMUS, Gunth.

Ann. and Mag. Nat. Hist., 1867, Vol. XX., p. 57.

D. 7. 1/8. A. 3/8. L. lat. 26-27.

Height of body two-fifths of the length without caudal. La line visible on the foremost scale only. The second dorsal spi longer than the third, and much longer than the second and t anal spines which are equal, not much shorter than the head, two-sevenths of the total length (without caudal). Uni greenish-olive, with a narrow bluish-silvery band along the m of the tail.

Cape York.

74. AMBASSIS AGASSIZII, Gunth.

Ann. and Mag. Nat. Hist., 1867, Vol. XX, p. 57.

D. 6. 1/7. A. 3/8. L. lat. 25.

The height of the body is contained twice and one-third in total length (without caudal). Lateral line none. The se dorsal spine scarcely longer than the third, much longer tha anal spines, shorter than the head without snout, and less one-fourth of the total length (without caudal). Body immac with a narrow bluish-silvery lateral band.

Clarence River.

75. AMBASSIS ELEVATUS, *n. sp.*

D. 7. 1/9. A. 3/9. L. lat. 25.

Height of body half the length without caudal. Præor and the inferior ridges of the præoperculum densely denticul the teeth pointing backwards. Second dorsal spine very long, more than a third of the total length, the second and third anal spines about the same size. The lateral line is indistinct and terminates under the soft dorsal, but there is a very distinct, straight median line; the pectoral fin reaches as far as the fourth anal ray, the tail is strongly bilobed, the lobes large, pointed and divergent. The colour is reddish, minutely speckled with blackish, more particularly on the fins; the opercles and the median line silvery.

Endeavour River.

Genus PSEUDOAMBASSIS, Casteln.

Like *Ambassis*, but without the procumbent spine in front of the dorsal fin.

Australia.

76. PSEUDOAMBASSIS MACLEAYI, Casteln.

Proc. Linn. Soc, N.S. Wales, Vol. III., p. 43.

Norman River.

77. PSEUDOAMBASSIS ELONGATUS, Casteln.

Proc. Linn. Soc. N.S. Wales, Vol. III., p. 44.

Norman River.

78. PSEUDOAMBASSIS PAPUENSIS, All. & Macl.

Ambassis Papuensis, Proc. Linn. Soc. N. S. Wales, Vol. I., p. 266, pl. 5, fig. 4.

South Coast of New Guinea (Chevert Exp.)

79. PSEUDOAMBASSIS CASTELNAUI, *n. sp.*

D. 7. 1/8. A. 3/8. L. lat. 22-24.

Height of body one-third of the length (without caudal). No lateral line, or only faintly shown on a few scales. Second dorsal

depression on the forehead between them. Colour bro
fins pale.

Murrumbidgee.

80. Pseudoambassis Ramsayi, *n. sp.*

D. 7. 1/9. A. 3/10-11. L. lat. about 20.

Height twice and one-third in the length without caudal. dorsal spine rather longer than the second, the third anal rather longer than the second; both stout. Lateral line sc traceable. Colour reddish-brown, a good deal mottled with about the back and with the membrane between the seco third dorsal spine black.

One specimen three inches long, marked Port Jacks Macl. Mus.

81. Pseudoambassis Jacksoniensis, *n. sp.*

D. 7. 1/10. A. 3/9. L. lat. about 22.

Height three times and one-third in the total length (w caudal); the third and fourth dorsal spines longest and the third anal longer than the second; a well marked median line; tail long, moderately bilobed. Colour pale with minute specks of black on the back and fins. A length two inches.

Port Jackson.

Genus Edelia, Casteln.

with two spines, scales large and rather adherent; lateral line interrupted.

82. EDELIA VITTATA, Casteln.

Proc. Zool. Soc., Victoria, Vol. II., p. 124.
D. 7. 1/9. A. 3/7. L. lat. 32.

Height of body one-third of the length (without caudal), back convex, upper profile of head straight, mouth oblique, præorbital strongly serrated, præoperculum rounded. Second spine of the dorsal fin longest and more than twice the length of the first. Lateral line interrupted below the soft dorsal; tail long and rather rounded. The colour in the spirit specimen is olive-green, with a broad, straight, longitudinal band of a fine red colour, extending from the posterior part of the operculum, at the height of the eye, to the base of the caudal; below this the body is silvery, each scale being bordered with olive; the belly is pink; the fins like the body olive-green. Length over two inches.

Fresh-waters, interior of Western Australia.

83. EDELIA VIRIDIS, Casteln.

Proc. Zool. Soc., Victoria, Vol. II., p. 125.
D. 7. 1/9. A. 3/8. L. lat. 28.

Differs from the last species in being of a higher form, in having the upper profile slightly convex, in having the first dorsal placed more forward, and in having the tail pointed. The colour is dark olive-green with the lower parts lighter. There is in some specimens a black blotch behind the operculum, over the insertion of the pectorals, and in others a somewhat ocellated spot on the base of the caudal fin. The fins are of an obscure yellow. Largest size one inch and a-half long.

Fresh-waters inland from King George's Sound.

Genus ACANTHOPERCA, Casteln.

This genus is fully described by Count Castelnau in the Proc. Linn. Soc. N. S. Wales, Vol. III., p. 44. Except in having the dorsals more continuous it seems not to differ much from preceding genus.

84. ACANTHOPERCA GULLIVERI, Casteln.

Proc. Linn. Soc. N.S. Wales, Vol. III., p. 45.

Norman River.

Genus NANNOPERCA, Gunth.

Body compressed, oblong, covered with scales of moderate Dorsal fins slightly contiguous at the base, the first with spines. Three anal spines. Narrow bands of villiform tee the jaws on the vomer, and on the palatine bones. *None bones of the head serrated.* Six branchiostegals. Pseudobran No lateral line.

85. NANNOPERCA AUSTRALIS, Gunth.

Proc. Zool. Soc., 1861, p. 116, pl. 19, fig. 2.

D. 7. 1/8. A. 3/7. V. 1/5. L. lat. 30. L. transv. 12.

Height of body four times and five-sevenths in the total le the length of the head thrice and two-thirds in the same. M narrow and oblique, the lower jaw projecting. The eye is wider than the interorbital space. The ridges of the operculum are close together and smooth; the second d spine is the longest, and double the length of the first; anal strong, the second and third about equal. Caudal fin rour the ventrals inserted behind the pectorals, and do not reac vent. The colour of the dried specimens seems to have greenish above, each scale having a darker margin. From to three inches long.

The Murray River.

86. NANNOPERCA RIVERINÆ, *n. sp.*

D. 8/8. A. 3/6. L. lat. about 24. L. transv. 15.

Height of body about a third of the length without cauda Eye rather large, about the length of the snout, but less tha distance between the orbits. Snout and forehead covered with skin, and with muciferous cavities. Mouth slightly oblique; third dorsal spine longest, second anal stronger, but not longer than the third. Some of the scales on the sides marked as in a lateral line. Colour in spirits, a yellowish-brown with the middle of each scale darker.

Murrumbidgee River. Two inches long.

Genus Apogon, Lacep.

Seven branchiostegals. Teeth villiform, no canines, teeth on the palate, tongue smooth. Two dorsal fins, the first with six or seven spines. Anal fin with two spines. Operculum spiniferous; præoperculum with a double serrated ridge. Scales large, deciduous.

Found throughout all the Indian and Australian seas, sometimes in fresh-water.

87. Apogon fasciatus, White.

Gunth. Cat. Fishes, Vol. I., p. 241.

Amia fasciata, Bleek., Atl. Ichthyol. Perc., pl. 48, f. 4.

D. 7. 1/8. A. 2/8. L. lat. 28.

Height nearly half of the length without tail; space between the eyes much smaller than the diameter of the orbit and much channelled; tail slightly emarginate. Colour brownish-red with five longitudinal black bands on each side, the first close to the back, the second from above the eye to the upper margin of the tail, the third along the middle of the side and extending nearly to the extremity of the tail, the fourth from below the eye to the inferior margin of the tail, the fifth along the belly and more or less indistinct; there is also a black bar at the base of the soft dorsal and anal fins.

Port Jackson and Northern Coast. Length five inches.

This is the most common Port Jackson species and is w doubt the true *A. fasciatus*, White, but I doubt its identit *A. Aroubiensis*, Hombr. and Jacquin, *A. endeka-tænia*,] and even with the *A. fasciatus*, Gunth., Journ. Mus., G Fish, Sud. Sea, Heft I., tab. 20 A. B.

88. Apogon Cookii, *n. sp.*

D. 7. 1/8. A. 2/8. L. lat. 35.

Height nearly one-third of length without tail; space b the eyes flat, and nearly equal to the diameter of the Præoperculum more prominently rounded than in *A. fa* Colour yellowish, in spirits, with four or five very broad, tudinal brown bands, placed as in *A. fasciatus*, but termi in a somewhat round, brown patch at the root of the tail.

Endeavour River and Darnley Island. Length three in

89. Apogon Victoriæ, Gunth.

Cat. Fishes, Brit. Mus., Vol. I., p. 243.

D. 7. 1/9. A. 2/8. L. lat. 24. L. transv. 2/6-7.

Yellowish-olive (in a dried state) with four darker longi bands on each side; root of the pectoral deep black, p yellow. All the outer edge of the præoperculum dentic the inner entire.

Victoria River. Length three inches and nine lines.

90. Apogon quadrifasciatus, Val.

Gunth. Cat. Fishes I., p. 239. Bleek. Atl. Ichth. Perc., pl.

Caudal fin notched. Whitish (in spirits): on each si parallel, brown, longitudinal bands; fins yellowish; th half of the anterior dorsal more or less intense black.

North Australia (Macgillivray).

91. APOGON GUNTHERI, Casteln.

Proc. Zool. Soc. Melbourne, I., p. 46.

D. 7. 1/9. A. 2/7. L. lat. 26. S. transv. 11-12.

Height two and a-half times in the total length. Colour brownish-pink, without spots or bands. Side of head with a golden tinge, all the scales covered with minute black dots; throat sometimes inflated.

Port Phillip, Tasmania and Port Jackson. Length four inches.

This is probably *A. Novæ Hollandiæ*, Val., a species described long ago, but in a publication which is not accessible to me.

92. APOGON HYALOSOMA, Bleek.

Gunth. Cat. Fishes I., p. 231.

Amia hyalosoma, Bleek., Atl. Ichth. Perc, pl. 31, fig. 4.

D. 6. 1/8. A. 2/7.

Uniform yellowish, with a black spot at the root of the caudal fin; interspace between the second and third dorsal spines black. Suprascapular, sub and interoperculum entire; the upper maxillary bone reaching to before the posterior half of the eye.

Port Darwin.

93. APOGON TORRESIENSIS, Casteln.

Researches on Fishes of Victoria, p. 9.

D. 6. 1/8. A. 2/7.

Tail furcate, space between the second and third dorsal spines and the end of the second dorsal obscure. General colour brownish-olive, the posterior edge of the body scales rather darker, fins transparent, an obscure blotch on each side of the tail.

Cape York. Length four inches.

I think this may probably be only a variety of *A. hyolosoma*.

94. Apogon trimaculatus, Cuv. & Val.

Gunth. Cat. I., p. 233 Casteln. Res. Fishes of Austr

D. 6. 1/9. A. 2/9.

Brownish-red, with a black blotch under the spinou another below the soft dorsal, and a third on the upp the tail.

Cape York. Length five and a-half inches.

95. Apogon Ruppellii, Gunth.

Gunth. Cat. I., p. 236.

D. 7. 1/9. A. 2/9-10. L. lat. 26. L. transv. 2

Reddish, with lighter fins; seven small black spots occiput along the back, nine others along and above t line, and two or three dots on the back of the tail; a streak from the eye to the angle of the præoperculum.

Port Darwin. Length four inches.

96. Apogon opercularis, Macl.

Proc. Linn. Soc. N. S. Wales, Vol. II., p. 347, pl. 8

Port Darwin.

97. Apogon guttulatus, All. & Macl.

Proc. Linn. Soc. N. S. Wales, Vol. I., p. 267, pl. 5,

Darnley Island.

98. Apogon aterrimus, Gunth.

Ann. and Mag. Nat. Hist., 3rd series, Vol. XX.]

D. 7. 1/9. A. 2/8. L. lat 25.

The height of the body is one-third of the total lengt the caudal fin. Entirely uniform deep black.

Cape York.

Genus APOGONICHTHYS, Bleek.

Differs from *Apogon* only in having the double ridge of the præoperculum smooth.

99. APOGONICHTHYS APRION, Richards.

Gunth. Cat. Fish I., p. 247.

Caudal fin rounded. First dorsal with six spines, a small cluster of teeth on the tongue. L. lat. 40. L. transv. 5/13. Brownish, with about eight blackish cross-bands on the back; top of the first dorsal deep black.

Port Essington.

100. APOGONICHTHYS POLYSTIGMA, Bleek.

Gunth. Cat. Fish I., p. 246.

Brownish: fins red; operculum with a large blue, lighter edged spot; two oblique brown bands from the eye to the præoperculum, each scale with a blackish spot at the base. L. lat. 28. L. transv. 9-10.

Port Darwin.

101. APOGONICHTHYS GILLII, Steind.

Apogon Gillii, Gunth., Ann. Nat. Hist. 1876, p. 392.

Mionurus lunatus, Krefft, Proc. Zool. Soc. 1867, p. 942.

D. 6. 1/9. A. 2/8-9. L. lat. 27. L. transv. 3/11.

Height of body twice and two-thirds in the length (without caudal); the length of the head twice and a-half. Upper profile of snout concave; lower jaw prominent. Caudal fin rounded. Brownish, irregularly mottled with darker, a pair of dark spots at the root of the caudal.

Rockhampton (Damel); Cox's River (Krefft).

102. Apogonichthys adspersus, Casteln.

Proc. Linn. Soc. N. S. Wales, Vol. II., p. 226.

Rockhampton.

103. Apogonichthys Darnleyensis, All. & Macl.

Proc. Linn. Soc. N. S. Wales Vol. I., p. 268, pl. 5, fig. 3

Darnley Island.

104. Apogonichthys marmoratus, All. & Macl.

Proc. Linn. Soc. N.S. Wales, Vol. I., p. 268, pl. 5, fig. 2.

Cape Grenville.

105. Apogonichthys roseobrunneus, *n. sp.*

D. 6. 1/9. A. 2/8. L. lat. 24. L. transv. 3/10.

Height of body and length of head the same and nearly o third of the total length. Mouth large; eye rather small, a li less than the space between the orbits. A prominent ridge the suture of the sub and interoperculum. Colour unifo reddish-brown, the first dorsal and ventral clouded with brow

One specimen four inches long in the Macleay Museum, label "from River in Northern Queensland."

Genus Cheilodipterus, Lacep.

Seven branchiostegals. Villiform teeth in the jaws with addition of canines; teeth on the palatine bones. Two dor fins, the first with six spines; anal fin with two. Præopercul generally with double serrature. Scales large, deciduous.

Red Sea; Indian Ocean; Pacific.

106. Cheilodipterus quinquelineatus, Cuv. & Val.

Gunth. Cat. Fishes I., p. 248. Bleek. Atl. Ichth. Perc., pl. 48, f.

Caudal fin notched. Body with ten black longitudinal bands four on each side; one along the middle of the back, and one the belly, a black spot on the tail with yellow centre; the first dorsal fin black in front.

Cape York. (Castelnau).

Genus GULLIVERIA, Casteln.

Teeth numerous, short, conical, swollen at the base, no canines, an angular line of teeth on the palate, tongue smooth; præoperculum not denticulated; two dorsal fins, the first with six spines, the second with one long spine, anal with two spines. General form oval, compressed, scales rather large; mouth rather oblique.

107. GULLIVERIA FUSCA, Casteln.

Proc. Linn. Soc. N. S. Wales, Vol. III., p. 45.

Norman River.

108. GULLIVERIA FASCIATA, Casteln.

Proc. Linn. Soc. N. S. Wales, Vol. III., p. 46.

Norman River.

Genus AIDA, Casteln.

Teeth minute, in a single row, two feeble canines in the upper jaw, a transverse row on the palate; mouth very oblique, opercles unarmed, body very compressed, scales large, no lateral line; two dorsal fins, the first with five spines, the last four elongate; the second with one spine and thirteen rays, increasing in length backwards; tail bilobed. Anal fin with two spines and seventeen rays, shaped like the soft dorsal. Ventral fins inserted behind the pectorals and united at their base.

109. AIDA INORNATA, Casteln.

Researches on Fishes of Australia, p. 10.

Height of body three times in the length (without caudal); head nearly three times and a-half in the same; eye equal to

the snout and three times and one-third in the length of the
L. lat. 32. General colour silvery, with a greenish tinge;
yellow; dorsal, caudal, and anal fins edged with black.

Gulf of Carpentaria. One specimen two and a-half inches

Genus VINCENTIA, Casteln.

Differs from *Agogon* in having no teeth on the palate, an
scales more adherent.

110. VINCENTIA WATERHOUSEI, Casteln.

Proc. Zool. Soc. Victoria, Vol. II., p. 60.

D. 7. 1/7. A. 2/7. L. lat. 24. L. transv. 12.

Height of body over three times in the total length, head
times and a-quarter in the same; orbit three times in the l
of the head. Head very large; lower jaw shorter than the u
teeth minute, numerous, villiform; body compressed; caud
rounded. Colour reddish: the top of the head and tips
fins, except the pectorals, have a purplish black tinge; the
of the ventrals are black; there are also some irregular
spots on the body.

St. Vincent's Gulf, South Australia. Length four inches

Group *Grystina.*

Genus ARRIPIS, Jenyns.

Seven branchiostegals. Teeth villiform, without can
teeth on the palatine bones, tongue smooth. One dorsal fin,
nine slender spines, anal with three. Operculum spinif
præoperculum denticulated. Scales moderate.

Australian Seas.

111. ARRIPIS GEORGIANUS, Cuv. & Val.

Richards, Voy. Erebus and Terror, p. 117, pl. 54, f. 3—

Gunth. Cat. Fish I., p. 253.

D. 9/14. A. 3/10. L. lat. 55. Cæc. pylor. 17.

Height of body four times and a-half in the total length, and length of head nearly four times in the same. Diameter of eye one-third of length of head; præoperculum finely serrated, operculum with two spines. The fourth dorsal spine longest. Greenish or yellowish olive, in spirits, with a brownish spot in the middle of each scale.

Western Australia, South Australia, Victoria, and ? New South Wales.

112. ARRIPIS SALAR, Richards.

Voy. Erebus and Terror, p. 29, pl. 20, f. 4-6. Gunth. Cat. Fish I., p. 253.

Centropistes truttaceus, Cuv. & Val.

The Salmon of Sydney and Melbourne Fishermen.

D. 9/16-17. A. 3/10. L. lat. 48-52. L. transv. 6/12. Cæc. pylor. 50. Vert. 10/15.

Height of body one-fourth of the total length and equal to the length of the head; the diameter of the eye is one-fifth of the latter. Præoperculum serrated behind and beneath; sub and interoperculum with scales. The fourth dorsal spine longest; the third of the anal rather longer the second. Back with darker spots.

East and South Coasts.

Genus ODONTONECTES, Gunth.

Six branchiostegals. Teeth villiform on the jaws, vomer, and palatine bones, an outer series of larger teeth on the jaws; canines very small. One dorsal fin with ten spines, the basal half scaly; anal fin with three spines. Præoperculum very slightly serrated at the angle. Scales moderate without apparent

serrature. Mouth oblique, the lower jaw longest. Eye mo
Pyloric appendages in small number; air bladder with two
processes in front to the base of the skull.

East Indian Seas.

113. ODONTONECTES ERYTHROGASTER, Cuv. & Val.

Gunth. Cat. Fishes, Vol. I., p. 265.

D. 10/15. A. 3/11. L. lat. 53. L. transv. 7/13. Vert
Cæc. pylor. 5.

Height three times and a-half in the total length; the
of the head four-times; snout equal to the diameter of t
and one-fourth of the length of the head. The maxillary
beyond the vertical from the anterior margin of the eye
operculum rounded at the angle. The spines of the fins
and flexible, the fourth of the dorsal longest. Tail deeply
the second and third anal spines nearly equal. Above
green; belly rose-coloured.

Fitzroy Island (Chevert Exp.)

Genus OLIGORUS, Gunther.

Seven branchiostegals. All the teeth villiform without c
teeth on the palatine bones, tongue smooth. One dorsal fi
eleven spines, the anal with three. Operculum with one
præoperculum with a single smooth or obtusely denti
ridge. Scales small. The number of pyloric appendages

Australian Rivers.

114. OLIGORUS MACQUARIENSIS, Cuv. & Val.

Gunth. Cat. Fishes, Vol. I., p. 251.

The *Cod* of the Colonists. *Kookoobul* of the Murrumbidgee

D. 11/14-16. A. 3/12. Cæc. pylor. 3.

The height of the body is four times and three-quarters
total length, the length of the head three and a-half; the di

of the eye is one-seventh of the latter. Præoperculum, suprascapula and præorbital entire; pectoral and ventral fins short, caudal rounded, the fifth dorsal spine longest, the second and third of the anal nearly equal. Colour greenish-brown, with numerous small dark green spots; belly whitish.

All the rivers of the Murray system, and some of the northern coast rivers of New South Wales.

115. OLIGORUS MITCHELLI, Casteln.

Proc. Zool. Soc. Victoria, Vol. II., p. 150.

Differs from *O. macquariensis* in having the head much broader, the eye considerably larger, it being one-sixth of the length of the head, the upper jaw longer than the lower, the operculum more rounded and the caudal fin a little longer. The height of the body also is three times and a-third in the length without the caudal, instead of four times and a-half as in the other species, and the upper profile is more convex.

In all the Western rivers.

116. OLIGORUS TERRÆ-REGINÆ, Rams.

Proc. Linn. Soc. N. S. Wales, Vol. V., p. 93, pl. 9.

One specimen in the Australian Museum from Brisbane, measuring six feet in length and weighing over one cwt.

Genus HOMALOGRYSTES, All. & Macl.

Body oblong. Mouth large. Lower jaw longer than the upper. A broad band of acute recurved, somewhat conical teeth in both jaws; a band of similar teeth on the vomer and palatine bones. Two canines close together in front of the upper jaw; tongue smooth. Six branchiostegals. Operculum armed. Præoperculum bluntly serrated and emarginate on the posterior edge. Eye moderate. Scales small. One dorsal fin with eleven spines. Caudal fin rounded.

117. HOMALOGRYSTES GUNTHERI, All. & Macl.

Proc. Linn. Soc. N. S. Wales, Vol. I., p. 269.

Torres' Straits, near Katow.

Genus CTENOLATES, Gunth.

Seven branchiostegals, pseudobranchiæ, teeth villiform in bands, teeth on the palatine and vomer, tongue smooth. The spinous dorsal is continuous with the soft, and composed of ten spines. Præoperculum finely serrated behind with small denticulations on the lower limb; præorbital serrated. Scales small, strongly ctenoid.

Australian rivers.

118. CTENOLATES AMBIGUUS, Richards.

Datnia ambigua, Rich., Voy. Erebus and Terror, p. 25, pl. 19.

Dules ambiguus, Gunth., Cat. I., p. 270.

Dules auratus, Casteln., Proc. Zool. Soc., Vict., I., p. 55.

Ctenolates macquariensis, Gunth., Proc. Zool. Soc. 1871, p. 390, p. 33.

The "*Golden Perch*" and "*Yellow belly*" of the Colonists. "*Kaakaalain*" of the Murrumbidgee natives.

D. 10/11. A. 3/8. L. lat. 76-81. L. transv. 13/28.

Height two-fifths of the length without caudal; length of head one-third. Upper profile very convex above the nape, and deeply concave on the occiput; the maxillary reaches to below the middle of the eye. Mandible prominent. The diameter of the eye is one half of the length of the snout and one-fourth of the post-orbital portion of the head. Scales on the cheek numerous, only half the size of those on the operculum. The denticulations of the lower præopercular limb are small, irregular and directed forwards. Spines of fins strong, the last dorsals much shorter than the rays. Caudal and pectorals rounded. First ventral ray elongated. Colour greenish on the back with the sides and belly golden yellow, the vertical fins are faintly marked or bordered with black.

All the rivers of the Murray system.

I have no doubt that these are all one and the same species, though the variations in the descriptions are sufficient to excite some uncertainty. The genus *Ctenolates* has been very properly separated by Dr. Gunther, (Proc. Zool. Soc. 1871, p. 320.) from *Dules*.

119. CTENOLATES CHRISTYI, Casteln.

Dules Christyi, Casteln., Proc. Zool. Soc., Vict., I., p. 57.

D. 10/11. A. 3/8. L. lat. 52. L. transv. 8/18.

Height three times and one-fourth in the total length; head four times and one-sixth in the same; orbit four times and a-half in the head, the latter cavernous. Upper profile much elevated, almost gibbous behind the eye. Body highest at the base of the pectorals. The teeth are numerous, but seem to be wanting on the palatine bones. Coracoid much denticulated. Soft dorsal and anal fins scaly for one-third of their height. Colour brownish purple above, and white below.

One specimen fourteen inches long from the Edwards River, near Deniliquin.

120. CTENOLATES FLAVESCENS, Gunth.

Dules flavescens, Gunth., Res. Fishes of Victoria, p. 10.

D. 10/10. A. 3/9. L. lat. 89.

Form elongate, height of body three times and two-thirds in the length, and head three times, without the caudal fin. Præorbital entire. Præoperculum finely serrated behind, and bilobed beneath with strong obtuse spines. Operculum covered with scales much larger than those on the cheek, and armed with a long, flat spine. Scales larger below the lateral line than above.

Dorsal and anal fins in great part covered with scales. Colour ochreous golden-yellow, back slaty-grey, belly white, mouth reddish, ventrals white and eye silvery.

One specimen nineteen inches long, from the Murray.

Genus MURRAYIA, Casteln.

A genus placed by Count Castelnau between *Dules* and *Therapon* and characterized as having eleven dorsal spines, operculum denticulated in all its length, a line of small teeth on the palatine bones, the caudal fin rounded, scales minutely serrated and the head cavernous.

Australian rivers.

121. MURRAYIA GUNTHERI, Casteln.

Proc. Zool. Soc. Victoria, Vol. I., p. 61.

D. 11/12. A. 3/8. P. 16. C. 16. L. lat. 50. L. transv. 10/18.

Height three and one half times in the length; head three times and two-thirds in the same; eye four times and a-half in the length of the head. Upper profile very convex, the back being elevated and gibbous behind the head; upper surface of head naked; præorbital very finely denticulated; præoperculum slightly emarginate behind, and finely serrated, the serrations irregular and larger on the rounded angle and on the lower limb. Operculum with two broad flat serrated spines; superscapula and coracoid also serrated. The fifth dorsal spine is the longest; the soft dorsal is scaly; the second anal spine longest; the first ray of the ventrals prolonged into a filament. The general colour is purple, becoming redder towards the belly, the scales bordered with a dark tinge. The fins are purplish, the ventrals pink with the external third black: pectoral yellow. Eye bronze.

From the Murray River, average length fourteen inches.

122. MURRAYIA CYPRINOIDES, Casteln.

Prc. Zool. Soc., Victoria, Vol. I., p. 62.

D. 11/13. A. 3/9. L. lat. 52. L. transv. 10½/18½.

Height of body three times and one-third in the total length ; d three and a-half in the same, eye five and a-half in the gth of the head. Form more elevated and gibbous than in *theri*. The first ventral ray prolonged into a bifid filament. our, above green with the border of the scales darker, beneath low; the lateral line dark, sides of the head purple, pectorals k on the upper portion, yellow on the lower. The dorsal, dal and anal fins purple ; the ventrals pink with the spine ite.

Murray River. Length ten or twelve inches.

123. MURRAYIA BRAMOIDES, Casteln.

Proc. Zool. Soc. Victoria, Vol. I., p. 63.

11/12. A. 3/8. C. 17. P. 16. L. lat. 52. L. transv. 9/16.

Height four times in the total length, head three times and -thirds ; orbit three times and eight-tenths in length of head. ad very cavernous ; præoperculum straight, and finely rulated on the posterior limb, obtusely denticulated on the le, and on the inferior limb, with the denticulations pointing wards. The operculum is thinly serrated and has two angles, lower of which is a sort of flap divided into five flat spines ; superscapula is like a segment of a circular saw ; the fifth al spine is the longest ; anal spine slender ; the first ray of ventrals elongate. Colour dirty yellow, each scale with an cure border, head brown, lower parts reddish ; vertical fins k with the spines purple ; pectorals and ventrals pink. Eye low.

Murray River, rare ; about twelve inches in length.

124. MURRAYIA RIVERINA, Krefft.

Dules riverinus, Krefft, Proc. Zool. Soc., 1867, p. 943.

D. 11/11. A. 3/9. P. 15. L. lat. 58 to 60.

Height of body one-third of length, without the caudal f the diameter of the eye is equal to the length of the snout, long as the space between the eyes, and nearly one-fourth of length of the head. Operculum with two spines, the lower with two points. Tail truncate. Colour silvery on the sides, lateral line dividing the silvery part from the brown of the ba the scales are all dotted with black spots, as are the fins, the fi ray of the ventral is produced into a filament as long as the he

Murray River and its tributaries.

Genus RIVERINA, Casteln.

Resembles *Murrayia*, but has twelve spines in the dorsal and is without teeth on the palatine bones.

125. RIVERINA FLUVIATILIS, Casteln.

Proc. Zool. Soc. Victoria, Vol. I., p. 64.

D. 12/11. A. 3/8. C. 18. P. 16. L. lat. 46. L. transv.

Height of body three times and two-thirds in the total le head three times and six-tenths in the same. Form and c the same as *Murrayia bramoides*, but the head of a more fl colour. The first spine of the operculum is bifid, the se tridenticulated; the fifth dorsal spine the longest, the tw longer than the eleventh, the second anal spine is very thic blunt but not longer than the third; the first ray of the pect elongate.

Murray River; one specimen.

Genus DULES, Cuv. & Val.

Six branchiostegals. All the teeth villiform, without can teeth on the palatine bones. One dorsal fin, with ten sp anal with three. Operculum with two or three points, præoperculum serrated; chin not very prominent; eyes moderate.

Seas and rivers of tropical regions.

126. DULES HASWELLII, *n. sp.*

D. 10/11. A. 3/10. L. lat. 42. L. transv. 5/9.

Height of body one-third of total length, the length of the head nearly one-fourth. Eye large, its diameter being, about equal to its distance from the point of the muzzle, three times the height of the præorbital bone, and about half the width of the interorbital space, which is rather flat and concave in the profile; the mouth is slightly oblique, and the maxillary extends to rather beyond the vertical from the posterior margin of the orbit. The præoperculum is crenulated on the posterior edge· The scales are ctenoid, those on the opercles as large as those on the body. The fifth and sixth spines of the dorsal fin longest, the eleventh nearly as long, but much shorter than the anterior rays, the anal spines are strong and of nearly equal thickness, but increase in length backwards, the third much shorter than the first rays; the caudal fin is considerably emarginated; pectorals short. Colour silvery, very dark towards the back; many of the scales show dark spots, and there are distinct black spots on the opercles and near the anal fin. The vertical fins are blackish with the extreme tips whitish.

Fresh-waters Rockingham Bay. Length fourteen inches.

Genus MACQUARIA, Cuv. & Val.

Five branchiostegals. No teeth in the jaws or on the palate. Spines strong, eleven in the dorsal and three in the anal fins. Præoperculum serrated. Scales moderate.

127. MACQUARIA AUSTRALASICA, Cuv. & Val.

Gunth. Cat. Fishes I., p. 286. Less. Voy. Coqr., Zool. II., p. 194, pl. 14, f. 1.

D. 11/11. A. 3/8. L. lat. 65-66. Cæc. pylor. 8.

Externally very similar to *Ctenolates ambiguus*. Snout scaleless. The fourth and fifth dorsal spines longest, the second of the anal much longer and stronger than the third. Uniform brownish.

Macquarie River.

Genus THERAPON, Cuv.

Six branchiostegals. Eye of moderate size. Teeth, villiform in both jaws, deciduous on the vomer and palatine bones. Operculum spiniferous, præoperculum serrated. Dorsal fin more or less notched with twelve or sometimes thirteen spines; anal with three. Scales moderate. Air bladder with two divisions—an anterior and posterior, separated by a contraction. Cæca pylorica in moderate number.

Indian and Australian seas and rivers.

128. THERAPON THERAPS, Cuv. & Val.

D. 12/10. A. 3/8. L. lat. 55. Vert. 10/15.

Height of body three times and a-half in the total length, the head four times; snout once and a-third in the space between the eyes. Præoperculum rounded, serrated, with moderate teeth at the angle, operculum with two spines, the lower of which is elongate and strong. Greenish-grey, with three straight, brown longitudinal bands, the lowest of which extends from the head to the tail; the spinous portion of the dorsal fin blackish between the third and seventh spines; two or three blackish bands obliquely crossing each lobe of the tail.

Port Darwin and North-east Coast of Queensland.

This species which has a very wide range is figured in Bleeker's Atlas of the Percidæ, pl. 43, f. 1, with four longitudinal bands, and with a brown tip to the second dorsal fin.

129. THERAPON SERVUS, Bl.

Gunth. Cat. Fishes, Vol. I., p. 278.

D. 12/10. A. 3/8. L. lat. 80. Vert. 10/15.

The height of the body is nearly equal to the length of the head, and is contained three times and three-quarters in the total length. The snout is a little longer than the space between the eyes. Præoperculum rounded, serrated, with strong spinous teeth at the angle; operculum with two spines, the lower elongate and strong. Greenish-grey, with three curved, brown, longitudinal bands (the convexity towards the belly); the spinous portion of the dorsal fin blackish between the fourth and seventh spines; two blackish bands obliquely crossing each lobe of the tail.

North and North-east Coasts of Australia.

130. THERAPON CAUDOVITTATUS, Richards.

Gunth. Cat. Fishes, Vol. I., p. 284.

Datnia caudavittata, Rich., Voy. Ereb. & Terr., p. 24, pl. 18, f. 3-5.

D. 13/10. A. 3/8. L. lat. 46.

Snout rather longer than the diameter of the eye; præoperculum rounded, finely and equally denticulated. Opercular spines flat and rather short. Dorsal fin scarcely notched, the last spine as long as the first rays, the fourth, fifth and sixth longest, half as high as the body and slender. The second anal spine rather stronger than the third. Spotted with greyish-brown, each lobe of the caudal fin with a broad deep-black band.

Western, Northern, and North-eastern Coasts.

131. THERAPON TRIVITTATUS, Buch.

Gunth. Cat. Fishes, I., p. 280. Bleek. Atl. Ichth., pl. 62, f. 2.

D. 12/10. A. 3/9. L lat. 90-100. Cæc. pyl. 7. Vert. 10/15.

The height of the body is about one-fourth of the total length, the length of the head about the same; the length of the snout

is a little more than the space between the eyes. Præop
serrated, with very strong teeth at the angle; opercul
two spines, the lower elongate and strong. Greenish-gr
three straight, brown, longitudinal bands, the inferior e
from the eye to the tail; the spinous dorsal fin blackish
the third and eighth spines; two oblique blackish bands
lobe of the tail.

Torres Straits.

132. Therapon Cuvieri, Bleek.

Gunth. Cat. Fishes I., p. 282. Bleek. Atl. Ichth. Perc., pl.

D. 12/10. A. 3/10. L. lat. 66. L. transv. 12/23. Cæc. p

Height of body three and a-half times in the total
length of head four and a-half times; the diameter of
nearly five times in the length of the head, and one an
quarters in that of the snout. Præoperculum finely and
serrated; opercular spines feeble. Dorsal fin scarcely
with slender spines, the fifth and sixth longest; anal spine
Caudal very slightly emarginate. Four, five or six long
bands. Fins immaculate.

Port Jackson; East and North Coasts.

133. Therapon percoides, Gunth.

Ann. and Mag. Nat. Hist., 3rd Series, Vol. XIV., p.

D. 13/9. A. 3/8. L. lat. 39. L. transv. 7/13.

Height of body twice and a-half in the length, without
the length of the head twice and one-third. Upper su
head rather flat and scaleless; snout equal in length
diameter of the eye, and a little longer than the widt
interorbital space. Mouth small, the maxillary scarcely
to below the anterior margin of the orbit. Præorbital n
posteriorly and indistinctly serrated, præoperculum
serrated and obtusely rounded; operculum with two poi

lower spinous and rather prominent. Back greenish, shining silvery, passing into pure white below: five black cross-bands descend from the back towards the belly—the first from before the dorsal fin, the second from the fifth or sixth dorsal spine, the third from the last dorsal spine, the fourth from the posterior half of the soft dorsal, and the fifth across the tail. Vertical fins marbled with black. Infraorbital bones with a silvery band.

Rivers of Northern Queensland.

134. THERAPON FASCIATUS, Casteln.

Researches Fishes of Australia, p. 11.

D. 13/10. A. 3/7.

Height one-third of the total length, head one-fourth; snout less than the diameter of eye; a strong spine on the operculum; præoperculum with very strong spines directed upwards on its posterior edge. Colour slaty grey above, whitish below with transverse brown bands as in *T. percoides*, some faint transverse bands on the tail.

Swan River; ? Norman River.

135. THERAPON TERRÆ-REGINÆ, Casteln.

Proc. Linn. Soc. N. S. Wales, Vol. II., p. 227.

Rivers of Northern Queensland.

136. THERAPON HILLII, Casteln.

Proc. Linn. Soc. N. S. Wales, Vol. II., p. 226.

Upper Dawson River.

137. THERAPON ELLIPTICUS, Rich.

Gunth. Cat. Fishes I., p. 276.

Datnia elliptica, Rich. Fish. Ereb. and Ter., p. 118, pl. 52. f. 4—8.

D. 12/13-14. A. 3/8. L. lat. 85. L. tr. 17/31.

The height of the body is thrice and two-thirds in the total length; the length of the head is four times and one-third; snout moderately pointed, præoperculum serrated behind and below, the angle scaleless; præorbital serrated; two opercular spines, the lower is the broader and longer. Dorsal fin nearly even; caudal fin emarginate. The colour is silvery, with occasional black spots, a longitudinal band of the same colour below the eye; caudal, anal, and dorsal fins spotted. Pectoral with obscure transverse lines. The form is more elongate than in *Therapon Richardsonii*, with the back less convex and the head more so.

Rivers of Western Australia.

138. THERAPON RICHARDSONII, Casteln.

Proc. Zool. Soc., Victoria, Vol. I., p. 60.

"*Silver Perch*" of the Colonists, "*Kooberry*" of the Murrumbidgee natives.

D. 12/11-12. A. 3/8. C. 17. P. 16. L. lat. 65. L. tr. 17-25.

Height of body three times and eight-tenths in the total length, head four times and two-thirds in the same; the eye four times and one-seventh in the length of the head. The upper profile of the body strongly and equally convex, the lower almost straight; præorbital very strongly serrated; præoperculum rounded with long spines behind and shorter ones below; coracoid strongly serrated; operculum with two spines, the inferior strongest; dorsal fin received into a groove, the fifth spine the longest; anal spines very strong, the second most so. Caudal fin slightly emarginate. Colour greyish-blue, beneath whitish, sides shaded with yellow, each scale bordered with black; lips rosy; eye yellow; soft dorsal fin black on the upper part; ventrals white with the rays rosy; pectorals black on terminal half.

Found in all the rivers of the Murray system.

139. THERAPON NIGER, Casteln.

Proc. Zool. Soc. Victoria, Vol. I., p. 59.

D. 12/12. A. 3/8. C. 17. P. 15. L. lat. 89. L. trans. 14/28.

Height of the body three times and a-half in the length; head four times and two-thirds in the same; eye four times and one-third in the length of the head. Body convex above, less so beneath; præorbital strongly denticulated; præoperculum a little emarginate behind, and armed with strong spines, these spines longest at the angle which is rounded and much smaller on the lower limb. Operculum terminated by two bunches of flat spines, the first cf two, the second of six spines; the superscapula and coracoid are very strongly denticulated. The dorsal fin received into a groove on the back, the spines strong; the three first the shortest; the membranes of the soft dorsal scaly; caudal fin emarginate and scaly; anal spines large and striated; ventral spine strong, striated and longer than half the length of the fin. The back is grey, but appears dark on account of all the scales having a rather broad, black margin; beneath the colour is yellowish-white; fins grey; the posterior part of the caudal black.

From the Murray River; rarely seen. Length sixteen inches.

140. THERAPON UNICOLOR, Gunth.

Gunth. Cat. Fishes I., p. 277.

D. 12/10. A. 3/8. L. lat. 50. L. transv. 9/20.

Height of body four times in the total length, the length of the head four times and a-half; the space beteen the eyes is greater than their diameter, and the snout is still longer. Præoperculum rounded, finely serrated; præorbital and coracoid indistinctly denticulated. Operculum with two spines, the lower slightly pointed. Spines of the dorsal fin feeble, the sixth longest and three times and three-quarters in the length of the head.

141. Therapon truttaceus, *n. sp.*

D. 12/10. A. 3/8. L. lat. 45. L. transv. 10/18.

Height of body one-third of the length without caud space between the eyes flat, more than twice the diameter eye, and rather more than the length of the snout from t The lips thick, the cleft of the mouth oblique and reachin vertical from the anterior margin of the eye. Præope regularly rounded and finely denticulated, operculum w spine, coracoid denticulated with three or four spine-like t the lower angle; the first dorsal spine less than half the of the second, the fourth the longest; the fifth and sixth as long; the second and third anal spines equal. Ca somewhat emarginate. Coloration dark above, yellow be all the scales except on the belly are more or less ting spotted with a steel blue tint; all the fins except the vent of a dingy blackish colour.

Endeavour River.

142. Therapon nigripinnis, *n. sp.*

D. 12/9. A. 3/7. L. lat. 52. L. transv. 9/18.

Height of body one-third of the total length; length one-fourth of the same. Eye large, the diameter rathe than the length of the snout, but less than the space betw orbits. Top and back of the head scaleless, rather conv much grooved and convoluted : præorbital rounded and ob lower long, strong and acute. The spines of the dorsal fin strong, the fifth longest; the spine of the soft dorsal more than twice the length of the preceding one; the soft dorsal and anal fins lower than the spinous dorsal, the third anal spine the longest; caudal fin deeply emarginate, the lobes pointed; pectorals small, shorter than the ventrals. Colour silvery, each scale with a yellow or pearly centre. The top of the head and all the fins blackish, excepting the spinous dorsal, which seems to have been of a lighter colour, with a large black blotch from the third to the seventh spine.

Rockingham Bay. One specimen eight inches long.

143. THERAPON LONGULUS, *n. sp.*

D. 12/10. A. 3/7. L. lat. 48.

The height of the body is one-fourth of the total length, the length of the head nearly the same. The eyes are about the diameter of the orbit apart, the interspace flat and naked; the length of the snout is about the same. The teeth in the external row in both jaws are strong, regular, and a little curved. The præorbital is dentated behind over the maxillary, the præoperculum is strongly and regularly dentated on the posterior margin the denticulations becoming smaller below the angle; the lower point of the operculum is divided into two or three strong spines; the coracoid is large, free, and strongly denticulated. The dorsal spines are rather slender; the second and third anal spines are about equal; the tail is subtruncate. The coloration seems to have been uniform, in spirits the specimens present a dingy grey appearance all over. Length six inches.

Fresh-waters inland from Port Darwin.

Genus HELOTES, Cuv.

Differs from *Therapon* only in having the teeth lobed on each side.

144. Helotes sexlineatus, Cuv. & Val.

Gunth. Cat. Fishes I., p. 285.

D. 12/10. A. 3/10. L. lat. 110. L. transv. 35. Cæc. pyl
Vert. 10/15.

The height of the body equals the length of the head, and i and a-half times in the total. Teeth distinctly lobed. Oper with two short spines, the lower rather prominent; præoper rounded, denticulated; the fifth and sixth dorsal spine lo Six blackish-brown longitudinal bands on each side.

North and East Coasts. Port Darwin.

145. Helotes octolineatus, Jenyns.

Gunth. Cat. I., p. 285. Voy. "Beagle," p. 18.

D. 12/9. A. 3/7.

The height of the body is equal to the length of the head four and a-half times in the total length; jaws equal. distinctly three-pointed. Operculum with two spines—the one prominent. Light blackish-brown longitudinal ban each side.

King George's Sound. West Australia.

Group *Pristipomina.*

Genus Agenor, Casteln.

Body high, compressed. Teeth villiform in the jaws, a of acute conical teeth on the vomer and palatines; no m cheeks and opercles scaly. Vertical fins in great part covere scales; dorsal fin not notched, of ten spines. Scales rather Australia.

146. Agenor modestus, Casteln.

Proc. Linn. Soc. N. S. Wales, Vol. III., p. 371.

Port Jackson.

Genus PRISTIPOMA, Cuv.

Form of body oblong, compressed. Eye moderate. Cleft of mouth horizontal, not very wide, a central groove below the chin. One dorsal with eleven to fourteen spines; anal fin with three; vertical fins not scaly or on the basal portions only. Villiform teeth in the jaws without canines; no teeth on the palate. Seven branchiostegals. Præoperculum serrated; operculum with very indistinct points. Scales moderate, ctenoid. Pseudobranchiæ. Air-bladder simple; pyloric appendages in small number.

All the temperate and tropical seas of the world.

147. PRISTIPOMA HASTA, Bl.

Gunth. Cat. Fishes I., p. 289.

D. 12/14. A. 3/7-8. L. lat. 47. L. transv. 6/10. Cæc. pyl. 6.

Height three to three and a-half in the total length, head about equal to the height; snout longer than the width of the eye. Jaws equal, the maxillary reaches to below the anterior margin of the orbit. Præoperculum emarginate behind, its angle rounded, produced and denticulated. The fourth dorsal spine longest, and more than half the length of the head; a deep notch between the spinous and soft portion. Caudal fin truncate; the second anal spine very strong; pectorals pointed, elongate. Back and upper parts of the sides with brown spots, more or less regularly arranged, sometimes forming longitudinal series, sometimes cross-bars. The dorsal fin with two or three series of round, brown spots.

Torres Straits. South Coast of New Guinea.

148. PRISTIPOMA MACULATUM, Bl.

Gunth. Cat. Fishes I., p. 293. Bleek. Atl. Ichth. Perc., pl. 30, f. 2.

D. 12/13-14. A. 3/7. L. lat. 47.

The proportions are the same as in *P. hasta*, but the snout is not longer than the eye. The fins also and armature of the opercles are alike in the two species. There is a large cross-band before the dorsal fin, and six large blotches o side of the back, forming either two longitudinal rows or cross-bands; the spinous dorsal is blackish, with a series of spots along the base; the soft dorsal has two series of brown

Torres Straits (Voy. of the "Rattlesnake.")

Genus DIAGRAMMA, Cuv.

Body compressed, oblong, with the upper profile of the parabolic. Mouth small, horizontal. Eye moderate. Pra culum serrated; suborbitals without spines. Six or branchiostegals. No canine teeth. Four or six pores und mandibles, but no larger groove. One dorsal fin with n fourteen spines; anal with three. Scales rather small. bladder simple; pyloric appendages in small number.

In all temperate and tropical seas.

149. DIAGRAMMA AFFINE, Gunth.

Cat. Fishes I., p. 319, pl. 19. fig. A.

D. 14/16. A. 3/7. L. lat. 45. L. transv. 9/16.

Height of body two and a-half times in the total length, of head three times and two-fifths; the distance betwee dorsal and caudal fins is less than the height of the tail the end of the dorsal. Dorsal fin notched, with strong spin fourth the longest; the second anal spine much longe stronger than the third. Caudal fin slightly convex. Un brownish, the dorsal, anal, and ventral fins black.

North-west Australia.

150. DIAGRAMMA CRASSILABRE, All. & Macl.

Proc. Linn. Soc. N. S. Wales, Vol. I., p. 271, pl. 5, f.

South coast of New Guinea.

151. DIAGRAMMA POLYTÆNIA, Bleek.

Gunth. Cat. Fishes I., p. 332.

B. 6. D. 12/22. A. 3/7. L. lat. 100.

Height of body three and a-half times in the total length, the length of the head four and one-fifth times. The diameter of the eye is three and two-third times in the length of the head; the third, fourth, and fifth dorsal spines longest—one-third the height of the body. Caudal truncate; the second anal spine longer than the third. Yellow with nine bluish-white longitudinal bands, edged with black; the four upper ones terminating at the base of the dorsal, the four next at the caudal; the ninth near the anus.

Port Essington.

152. DIAGRAMMA MULTIVITTATUM, Macl.

Proc. Linn. Soc. N. S. Wales, Vol. II., p. 349, pl. 7, fig. 2.

Port Darwin.

153, DIAGRAMMA RETICULATUM, Gunth.

Cat. Fishes I., p. 334.

D. 13/21-22. A. 3/7. L. lat. 85. L. transv. 13/25.

The height of the body is three and a-half times in the total length, the length of the head four times. Caudal fin truncate; second anal spine stronger but scarcely longer than the third. Brownish-grey (in a dried state), reticulated with darker waved lines; three longitudinal bands on the opercles.

Cape York.

154. DIAGRAMMA NITIDUM, Gunth.

Cat. Fishes I., p. 335, pl. 19, fig. B.

D. 12/20. A. 3/7. L. lat. 95. L. trans. 20/25.

Height of body three and a-half times in total length, length of head four times. Caudal fin truncate; the second anal spine stronger, but scarcely longer than the third. Reddish-brown (in spirits), with six bluish, darker-edged, parallel, longitudinal bands; the first from the nape to the soft dorsal, the second from above the eye to the posterior third of the soft dorsal, the third from the eye on and above the lateral line to the back of the tail, the fourth from the eye below the lateral line to the middle of the tail, the fifth from below the eye to the inferior part of the caudal, the sixth from the mouth over the root of the pectoral to the end of the anal fin.

Australia (Gunther).

Genus HYPEROGLYPHE, Richards.

Body oblong, compressed. Eye moderate. Snout blunt, cleft of mouth oblique, with the upper jaw longest. Two dorsals, scarcely united, the first much lower than the second with eight short spines, anal fin with feeble spines. Præorbital and præoperculum serrated, operculum spiniferous. Seven branchiostegals. Villiform teeth in the jaws, without canines. Roof of the mouth with a deep longitudinal groove. Scales small, cycloid. Air bladder simple, pyloric appendages in great number.

An Australian genus.

155. HYPEROGLYPHE POROSA, Richards.

Gunth. Cat. Fishes I., p. 337.

Diagramma porosa, Rich., Voy. Ereb. and Terr., Fishes, p. 26, pl. 16, figs. 5, 6.

B. 7. D. 8. 1/20. A. 3/16. L. lat. 95-100.

The maxillary reaches to below the middle of the eye; both limbs of the præoperculum ciliated; caudal fin emarginate. Brownish in spirits, the soft dorsal and anal fins with two series of dark brown spots.

Coasts of Australia. Five and a-half inches long.

Genus HISTIOPTERUS, Richards.

It is with some doubt that I place this genus among the *Pristipomina*. Dr. Gunther makes no mention of the genus in his Catalogue, but when in 1871 he described a species of it in the Proc. Zool. Soc. of London, he placed it between a *Dentex* and a *Chætodon*, indicating, I fancy, that in his opinion that was its true position. Count Castelnau places it among the *Scombridæ*, and Richardson the founder of the genus among the *Chætodontidæ*.

I have never seen any description of the genus, but it may be shortly defined thus: Body oblong, highest at the occiput, and tapering towards the tail. Head prolonged into a slightly recurved snout. Teeth villiform, forming bands; dorsal fin with seven or eight spines the first three short and more or less detached; anal spines two or three.

156. HISTIOPTERUS RECURVIROSTRIS, Rich.

Voy. Ereb and Terror, p. 34, pl. 22. Casteln. Proc. Zool. Soc. Victoria, I., p. 109.

D. 8. 1/15. A. 3/10. L. lat. 130.

Height of body three times and a-half in the total length, head three times and a-half in the same; the orbit four times and a third in the length of the head. The greatest height of the body is at the back of the head, from this there is gradual conical diminution to the tail; the head isprolonged into a long narrow snout, half the length of the head. The head is covered with bony plates which are strongly striated; the teeth are numerous, in several series, some of those in front longer and a little curved; lateral line sinuous; scales small. The spines of the dorsal fin are seldom united by a membrane, the fourth is the longest; the soft dorsal and anal of triangular form; caudal slightly emarginate; ventrals very large; pectorals rather long. Colour above greyish-blue, beneath whitish, a broad black arched band extends from the beginning of the dorsal to the end of the anal fin, sometimes another fainter band in front of it; a white band on the cheek. Eye yellow, encircled with brown. (Castelnau).

Port Phillip and Tasmania. Length from fifteen to twenty inches.

157. HISTIOPTERUS LABIOSUS, Gunth.

Proc. Zool. Soc., 1871, p. 658, pl. 59.

Richardsonia insignis, Casteln., Proc. Zool. Soc. Victoria I., p. 112.

B. 6. D. 7/17. A. 2/11.

The height of the body is somewhat less than the length of the head, and one-third of the total (without the caudal). Upper profile of the head concave, snout much produced, the eye being entirely in the posterior half of the head. Mouth moderate, lower jaw slightly the longer, lips and chin densely covered with short papillæ. The teeth are in bands *en cardes*, and most of those on the sides are obtuse and molar-like. Scales on the cheeks hidden below the skin. Præoperculum with the hind margin concave and the angle projecting; that and the lower limb indistinctly denticulated. Opercles scaleless. Scales very small; the fourth dorsal spine the longest. Caudal fin emarginate with the angles pointed. Brown, with indistinct, blackish, longitudinal markings. Length of specimen twenty-five inches.

South Australia, Melbourne, and Tasmania.

Genus LOBOTES, Cuv.

Form of body and vertical fins rather elevated. Eye rather small. Snout blunt; mouth oblique, the lower jaw the longer. One dorsal with twelve spines, the anal with three. Caudal fin rounded. No canine teeth. Præoperculum denticulated; operculum with obtuse points. Scales moderate, ctenoid. Six branchiostegals. Air bladder simple, pyloric appendages few. Pseudobranchiæ developed.

Found in every sea.

158. LOBOTES AUCTORUM, Gunth.

Cat. Fishes I., p. 338.—Bleek. Atl. Ichth. Perc., pl. 33, f. 4.

D. 12/15-16. A. 3/11. L. lat. 45. Cæc. pyl. 3. Vert. 13/11.

Caudal fin rounded; the soft dorsal and anal fins rather elevated; nape concave; eye small. Uniform brownish, yellowish or blackish, caudal fin sometimes with a lighter edge.

Port Jackson. Var. *somnolentus*. Endeavour River.

Genus GERRES, Cuv.

Body compressed and elevated. Mouth very protractile. Eye rather large. No canine teeth. Præoperculum generally entire. Six branchiostegals. One dorsal fin deeply notched with nine spines; anal with three. Caudal fin forked. Scales moderate, or minutely ciliated. Air bladder simple, pyloric appendages in small number. Pseudobranchiæ.

All tropical seas, entering rivers.

159. GERRES ABBREVIATUS, Bleek.

Gunth. Cat. Fishes I., p. 345.—Bleek. Atl. Ichth. Perc., pl. 78, f. 4.

D. 9/10. A. 3/7. L. lat. 33. L. transv. 5/10.

The height of the body is contained twice and two-thirds in the total length; the diameter of the eye is one-third of the length of the head. Præorbital and præoperculum entire: the second spine of the dorsal fin more than half the height of the body, and nearly as long as the head; the second and third anal spines strong and rather longer than the rays, one third the height of the body. Coloration uniform; dorsal fin black-edged.

Cape Grenville (Chevert Exp.)

160. GERRES CHEVERTI, All. & Macl.

Proc. Linn. Soc. N. S. Wales, Vol. I., p. 272, pl. 7, f. 1.

Cape Grenville (Chevert Exp.)

161. Gerres longicaudatus, All. & Macl.

Proc. Linn. Soc. N. S. Wales, Vol. I., p. 272, pl. 7, fig. 2.

Cape Grenville (Chevert Exp.)

162. Gerres carinatus, All. & Macl.

Proc. Linn. Soc. N. S. Wales, Vol. I., p. 273, pl. 7, fig. 4.

Darnley Island (Chevert Exp.)

163. Gerres bispinosus, All. & Macl.

Proc. Linn. Soc N. S. Wales, Vol. I., p. 273, pl. 7, fig. 3.

South coast New Guinea (Chevert Exp.)

164. Gerres profundus, Macl.

Proc. Linn. Soc. N. S. Wales, Vol. II., p. 350, pl. 7, fig. 3.

Port Darwin.

165. Gerres punctatus, Cuv. & Val.

Gunth. Cat. Fishes I., p. 346.—Macl., Proc. Linn. Soc. N.S.W
Vol. II., p. 350.

D. 9/10. A. 3/8.

The height of the body is contained thrice and a-half in th total length. The second dorsal spine is prolonged into a sho filament, and is sometimes as long as three-quarters of the heig of the body. Silvery, dorsal with a narrow black margin, eac ray with a brown point at the base. Young individuals wit indistinct cross-bands.

Port Darwin.

166. Gerres ovatus, Gunth.

Cat. Fishes I., p. 343, pl. 20, fig. a.

D. 9/10-11. A. 3/7. L. lat. 36. L. transv. 5/10.

The height of the body is twice and a-quarter in the lengt (without caudal fin); the diameter of the eye is one-third of th length of the head, longer than the snout and equal to the distance between the eyes. The groove for the processes of the intermaxillary bones is short, and does not extend beyond the vertical from the anterior margin of the eye ; no scales between the groove and the orbit. The spines of the dorsal fin are slender and flexible, the second and third longest, and twice and a half in the height of the body, the last four spines half as long as the third. The third anal spine longest, shorter than the first ray, and nearly one-fourth of the height of the body. Coloration uniform, dorsal fin black-edged.

Port Jackson.

167. Gerres subfasciatus, Cuv. & Val.

Gunth. Cat. Fishes I., p. 343.

D. 9/10. A. 3/7.

Height of the body one-third of the total length, the snout rather shorter than the diameter of the eye. Spines of the fins slender, the third of the dorsal is the height of the body, its width less than one twelfth of its length, the second anal spine stronger, but rather shorter than the third, and about one-fifth of of the height of the body. Silvery, with six or seven indistinct vertical bands.

Port Jackson.

168. Gerres australis, Casteln.

Casteln., Res. Fishes of Australia, page 43.

Head three times in the length of the body (without the caudal fin), height of body twice and one-third in the same, snout equal to the diameter of the eye. The second dorsal spine is thick and long, half the length of the body, the third nearly as long, but slender; the second anal spine is stronger but shorter than the third. Colour silvery, with the upper parts purple, the soft dorsal has a line of faint obscure spots. An appearance in some specimens of faint transverse bands on the body. Length fro two to two and a-half inches.

Swan River, West Australia.

169. GERRES OYENA, Cuv. & Val.

Gunth. Cat. Fishes I., p. 352.—Bleek. Atl. Ichth. Perc. pl. 77, f. 5

D. 9/10. A. 3/7. L. lat. 35-38. Cæc. pylor. 3. Vert. 10/14.

The height of the body is contained twice and three-fourths i the length, without the caudal fin. Prœorbital and præoperculu entire; the latter with the angle slightly rounded. The snout i a little longer than the diameter of the eye, which is one-third o the length of the head. Spines of fins of moderate length an strength; the second of the dorsal one-half the height of the bod and twice as long as the second anal spine. Uniform silvery.

Torres Straits (Castelnau).

170. GERRES ARGYREUS, Cuv. & Val.

Gunth. Cat. Fishes I., p. 353.

D. 9/10. A. 3/7. L. lat. 45.

The height of the body is scarcely more than the length of th head, and is one-third of the length of the body (without th caudal fin); the diameter of the eye is one-third of the length o the head, and rather longer than the snout, the extent of whic equals the distance between the eyes. The groove for the processe of the intermaxillary bones is entirely scaleless, and does no extend to the vertical from the centre of the eye. The spines o the fins are slender; the second of the dorsal is one-half th height of the body and more than twice the length of the secon anal spine, which is rather stronger, but not longer than the third. Silvery; top of the dorsal fin blackish.

Port Jackson (Gunther).

171. Gerres filamentosus, Cuv. & Val.

Gunth. Cat. Fishes I., p. 345.—Bleek. Atl. Ichth. Perc., pl. 78, f. 3.

D. 9/10. A. 3/7. L. lat. 45. L. transv. 6/12.

The height of the body is twice and one-third in the length, (without caudal fin). Spines of moderate strength; the second of the dorsal produced into a filament, which sometimes extends to the tail. The scaly sheath of the dorsal is high; the second anal spine is stronger and shorter than the third, and one-third of the length of the head. Silvery, with obscure brown spots.

Endeavour River, and Torres Straits.

172. Gerres philippinus, Gunth.

Gunth. Cat. Fishes, Vol. IV., p. 258.

D. 9/10. A. 3/7. L. lat. 48. L. transv. 6/12.

The height of the body is contained twice and two-fifths in the length (without caudal); the length of the head twice and a-fourth, the length of the caudal fin is two-ninths of the total. The diameter of the eye is one-third of the length of the head, equal to the width of the interorbital space, and more than the extent of the snout. The groove for the processes of the intermaxillary bones is rounded behind, naked, and extends beyond the vertical from the anterior margin of the eye. The free portion of the tail is longer than high. The scaly sheath of the dorsal is very high. The second dorsal spine is elongate, equal to two-thirds the height of the body. The second anal spine is much stronger but scarcely shorter than the third, the posterior anal rays covered entirely by the scaly sheath. Pectoral fins very long, reaching to the second anal spine. Silvery, each dorsal ray and the posterior spines with a blackish dot near the base. Three and a-half inches long.

Cape York and Nicol Bay (Gunther.)

173. GERRES MELBOURNENSIS, Casteln.

Proc. Zool. Soc. Victoria, Vol. I., p. 158.

D. 9/16. A. 3/17. L. lat. 37-38.

Height twice and a-half in the length, without caudal ; large, contained twice and two-thirds in the length of the h profile over the eye and snout very convex ; the length o dorsal spines and rays slightly increase as they go backw caudal fin forked ; anal with the third spine longest, and rays decreasing gradually in length from the first ; pect shorter than the head, the third ray longest. General c silvery, the upper parts are blue, and the sides have a co tinge ; there are faint longitudinal lines due to the centre of scale being darker ; the spinous dorsal is purple, and the yellow ; the caudal also yellow ; and the anal, pectorals, ventrals pink. Eye yellow, the pupil rather angular.

Melbourne, in the month of July.

I have never seen this Fish, and doubt very much its b a *Gerres*.

Genus GERREOMORPHA, All. & Macl.

Characters of *Gerres*, but with ten dorsal spines.

174. GERREOMORPHA ROSTRATA, All. & Macl.

Proc. Linn. Soc. N. S. Wales, Vol. I., p. 274, pl. 8, fig.

Torres Straits.

Genus SCOLOPSIS, Cuv.

Form oblong. Eye moderate. Snout moderate, with the of the mouth nearly horizontal. One dorsal with ten sp anal with three ; tail more or less forked. Infraorbital with a spine directed backwards. Præoperculum gene denticulated; operculum with an indistinct spine. S moderate, ctenoid. Five branchiostegals. Pseudobranchiæ. Air bladder simple; pyloric appendages.

Warm seas from the Red Sea to the Pacific.

175. Scolopsis margaritifer, Bleek.

Gunth. Cat. Fishes I., p. 355.—Bleek. Atl. Ichth. Perc., pl. 39, f. 2.

D. 10/9. A. 3/7. L. lat. 40. L. transv. 4/15.

The height of the body is from three and a-fifth to three and a-third times in the total length, the length of the head about four and a-half times. The diameter of the eye is two and three quarters in the length of the head, longer than the snout, and equal to the distance between the eyes. Præorbital half as wide as the orbit, with a very long and strong spine and some denticulations beneath—the second of these terminating posteriorly in a small point, above the tip of the large spine. Præoperculum with strong short spinous teeth, each with a small hook at the base; the angle projecting backwards, strongly armed. The spines of the fins moderate, the second anal stronger but not longer than the third. The upper lobe of the tail longest. Greenish-olive, each scale with a pearl-coloured base. The marginal half of the dorsal fin violet.

Cape Grenville (Chevert Exp.)

176. Scolopsis longulus, Richards.

Ann. Nat. Hist. IX., 1842, p. 389.—Gunth. Cat. Fishes I., p. 363.

D. 10/9. A. 3/7. L. lat. 42. L. trans. 3/15.

The height of the body is about the length of the head and one-fourth of the total length. The diameter of the eye is rather shorter than the snout, and is three and three-fourths in the head. The præorbital is three-quarters as wide as the eye, with a small spine and some denticulations beneath; præoperculum with the posterior limb very finely serrated, and the angle rounded. Spines of fins moderate, the second anal shorter than the third. Caudal fin emarginate. A yellowish band broadly edged with l above and below, from above the pectoral fin to the roc caudal; two indistinct blackish lines above the lateral lin

Torres Straits, Port Essington, Port Darwin.

177. Scolopsis personatus, Bleek.

Gunth. Cat. Fishes I., p. 360.—Bleek. Atl. Ichth. Perc., pl.

D. 10/9. A. 3/7. L. lat. 50.

The height of the body is three times and three-fourth total length, the length of the head four times; the dia the eye is three times and a-third in the head. The pr is half as wide as the eye, and denticulated beneath th the snout is scarcely longer than the diameter of the eye. operculum with the angle rounded, and the posterior limb emarginated and strongly denticulated. The third an longest. Tail deeply forked with the lobes pointed; the of the ventral fin produced into a short filament. Snou violet, with a bluish band between the eyes, a broad yell from the eye to the tail, the soft dorsal with a violet behind.

Port Darwin.

Genus Dentex, Cuv.

Form oblong, a little elevated; eye moderate. Mout or less horizontal. One dorsal with from ten to thirteen anal with three. Caudal fin forked. Canine teeth. Pr entire, broad, distance between the eye and the cleft of th great. Præoperculum entire, with more than three s scales; operculum without prominent spine. Six branchi Scales moderate, ctenoid. Pseudobranchiæ. Swim-blad a notch posteriorly. Pyloric appendages in small numbe

Found in all Seas.

178. Dentex filifer, Casteln.

Castelnau, Researches on the Fishes of Australia, p. 12.

D. 12/9. A. 3/7.

The height of the body is three times and one-third in the total length; the head over three times and a-half in the same; the præoperculum has five series of scales; the teeth are numerous, villiform, with an external series of larger ones, and two strong canines on each side of the upper jaw in front, and one on each side in the lower jaw. The tail deeply forked with the third ray of the upper lobe produced into a filament as long as the total length of the fish; the ventrals have the outer ray elongate. Coloration silvery-white (in spirits), with the upper parts of a slate colour; a bright yellow stripe, rather broad, extends from below the eye to the base of the pectorals.

Queensland. One specimen nine inches long.

Genus Synagris, Gunth.

Characters the same as *Dentex*, except that there are *only* three series of scales between the eye and the angle of the præoperculum.

Found in the Indian and Pacific Seas.

179. Synagris furcosus, Cuv. & Val.

Gunth. Cat. Fishes I., p. 373.

D. 10/9. A. 3/7. L. lat. 48-50. L. transv. 4/14.

The height of the body equals the length of the head, and is one-fourth of the total; the diameter of the eye is thrice and two-thirds in the head, and once and a-half in the length of the snout. The præorbital is higher than the eye. Six canine teeth in each jaw. Spines of fins slender, flexible, the fourth, fifth, and sixth longest, about twice and a-third in the length of the head. Caudal fin deeply forked, scaly, the upper lobe rather the longer, the second and third anal spines very feeble and nearly equal in size; the posterior rays of the dorsal and anal fins sli elongate. Coloration uniform reddish-yellow.

North and North-east Australia, Palm Islands, and Grenville (Chevert Exp.)

180. SYNAGRIS TÆNIOPTERUS, Cuv. & Val.

Gunth. Cat. Fishes I., p. 374.—Bleek. Atl. Ichth. Perc , pl. 56

D. 10/9. A. 3/7. L. lat. 48. L. trans. 4/11.

The height of the body nearly equals the length of the l and is three times and two-thirds in the total length, the sn longer than the diameter of the eye, which is one-fourth c length of the head. The præorbital is as high as the eye. spines of the fins are slender, the posterior of the dorsa longest, but rather shorter than the rays. The third anal is intermediate in length between the second spine and th ray; the posterior rays of both dorsals and anal rather elon Rose-coloured, with yellow longitudinal bands on the bo yellow band from the base of the first dorsal spine to the l the last ray.

North-east Coast. Cape Sidmouth (Chevert Exp.)

Genus PENTAPUS, Cuv.

Differs from *Dentex* and *Synagris* chiefly in having th orbital narrow, the distance between the eye and the cleft mouth small, and the swim-bladder without notch behind.

East Indian and Australian Seas.

181. PENTAPUS VITTA, Cuv. & Val.

Gunth. Cat. Fishes I., p. 381.

D. 10/9. A. 3/7-8. L. lat. 60. L. transv. 6/20.

The margin of the præoperculum without scales, slightly st The height of the body equals the length of the head, a about one-fourth of the total length. The diameter of the eye is shorter than the snout, and the distance between the eyes one-fourth of the length of the head. Caudal fin forked, with acute lobes. The spines of the fins feeble, the second of the anal one half of the third. Scales of præoperculum in six series. A broad brownish band from the snout through the eye to the upper half of the root of the tail.

Western and North Western Coasts.

182. PENTAPUS SETOSUS, Bleek.

Gunth. Cat. Fishes I., p. 382.—Bleek. Atl. Ichth. Perc., pl. 46, f. 1.

D. 10/9. A. 3/7. L. lat. 60. Cæc. pylor. 5. Vert. 10/13.

The height of the body equals the length of the head, and is four times and three-fourths in the total length; the diameter of the eye is three times and a-half in the length of the head. The middle spines of the dorsal fin are the longest; the first ventral ray is produced into a filament which reaches the anal; the third anal spine is intermediate in length between the second spine and the first ray. The upper lobe of the caudal produced into a long filament. A blue and yellow band from the muzzle through the eye to the operculum; a brown blue-edged spot at the root of the caudal; dorsal fin with the upper margin yellow.

North Coast. Port Jackson (Macl. Mus.)

183. PENTAPUS PARADISEUS, Gunth.

Cat. Fishes I., p. 383, pl. 24, fig. A.

D. 10/9. A. 3/7. L. lat. 45. L. transv. 5/16.

The height of the body equals the length of the head, and is one-fourth of the total length (without caudal filament). The diameter of the eye is three times and three-quarters in the length of the head. Middle spines of dorsal fin longest; the first ray of the ventral sometimes prolonged into a filament, which does not reach the vent; the third anal spine intermediate in length between the second spine and first ray; the upper lob caudal produced into a long filament. Muzzle above silvery with two yellow cross-bands, the anterior runnin middle of the eye, crossing the præorbital. A third yello runs from the præorbital, along the inferior margin of th across the cheek, operculum and suboperculum, to the the pectoral. A silvery longitudinal band from the middl eye, along the side of the body below the lateral line, upper part of the tail, and convergent with another pearl- band from the origin of the anal: both the latter bands an acute angle in the middle of the base of the caudal fin. a pearl-coloured band on the back, along the base of th fin.

North and East Coasts. Cape Sidmouth (Chevert Exp

Genus Aphareus, Cuv. & Val.

Body oblong; eye moderate; mouth slightly obligue the lower jaw longer. One dorsal with ten or twelve spi anterior part highest, spines feeble, caudal fin deeply fork canines. No teeth on the palate; præorbital and præop entire. Scales rather small. Seven branchiostegals. Air- simple, a (respiratory) cavity behind the branchiæ, at the of the humerus; pyloric appendages in small number.

From the Red Sea to Australia.

184. Aphareus roseus, Casteln.

Proc. Linn. Soc. N. S. Wales, Vol. III., p. 373.

Port Jackson.

Genus Erythrichthys Temm. & Schleg.

Form elongate; eye moderate; mouth very protracti dorsal fins, with some isolated spines between. Tail fork teeth in the jaws or palate, cardiform teeth on the pha bones. Præoperculum entire. Scales rather small. Six or seven branchiostegals. Pseudobranchiæ.

Indian and Australian Seas.

185. ERYTHRICHTHYS NITIDUS, Richards.

Gunth. Cat. Fishes I., p. 395.

Emmelichthys nitidus, Rich., Voy. Erebus and Terror, p. 47, pl. 29, fig. 7-8.

B. 7. D. 9. 3/1/9-10. A. 5/10. L. lat. 96. L. transv. 8/20.

Uniform greyish-silvery. The angle of the præoperculum rounded.

West Australia.

FAMILY II. SQUAMIPINNES.

Perciform fishes, with the body generally very elevated, and with the vertical fins covered with small scales.

Genus CHÆTODON, Cuv.

Body much compressed and elevated. One dorsal fin without any notch, spinous and soft portions equally developed, none of the spines elongate. Muzzle short or of moderate length. No teeth on the palate; præoperculum entire or slightly serrated, without spine. Scales large or of moderate size. Six branchiostegals. Air-bladder with horns or two divisions. Intestinal tractus with many convolutions; pyloric appendages in moderate number.

All tropical Seas.

186. CHÆTODON STRIGATUS, Cuv. & Val.

Gunth. Cat. Fishes II., p. 34.

D. 11/17. A. 3/14. L. lat. 60. L. transv. 10/21.

Snout scarcely produced, equal to or rather shorter than the diameter of the eye; præoperculum very distinctly denticulated;

the soft dorsal fin not higher than the spinous, which is eq height to the distance between the posterior margin of th and the extremity of the snout. Body with five or six l longitudinal bands, the first and second continued on th dorsal, the fourth and fifth on the anal.

Port Jackson.

187. CHÆTODON SEXFASCIATUS, Richards.

Gunth. Cat. Fishes II., p. 35.

D. 10/21. A. 3/17-19. L. lat. 90.

Snout very slightly produced, about equal to the diame the eye; præoperculum very distinctly serrated. The dors anal fins rounded posteriorly. Six brown vertical band anterior of which goes through the eye from the nape of the to the root of the ventrals.

West Australia. King George's Sound (Macl. Mus.)

188. CHÆTODON AUREOFASCIATUS, Macl.

Proc. Linn. Soc. N.S. Wales, Vol. II., p. 351, pl. 8, fig

Port Darwin.

189. CHÆTODON OCELLIPINNIS, Macl.

Proc. Linn. Soc. N. S. Wales, Vol. III., p. 33, pl. 3, fig.

King George's Sound.

190. CHÆTODON OLIGACANTHUS, Bleek.

Gunth. Cat. Fishes II., p. 34.—Bleek. Atl. Ichth. Chætod.,
fig. 4.

D. 6/30. A. 3/20. L. lat. 46.

The anterior part of the soft dorsal fin elevated, the sixth the longest. Yellowish, with five brownish vertical bands first through the eye, the second across the opercle, the thi fourth to the anal fin, the fifth on the tail: the fourth with a round black spot at the base of the dorsal fin, the fifth edged with yellow; a red band from the snout to the forehead.

Port Jackson. Port Darwin.

191. CHÆTODON SETIFER, Bl.

Gunth. Cat. Fishes II., p. 6.—Less. Voy. Coquille, p. 175, pl. 29, f. 2.

D. 13/23. A. 3/20. L. lat. 33. L. transv. 6/13.

Snout produced, pointed, conical, one-half longer than the diameter of the eye; præoperculum very indistinctly serrated; the fifth dorsal ray more or less elongate, filiform. The ocular band extends over the interoperculum, is narrower above the orbit and wider below. The anterior part of the back with blackish streaks obliquely descending forwards, the rest of the body with streaks obliquely ascending forwards. Top of the dorsal behind the fifth ray, with a round black white-edged spot. The vertical fins with a very fine blackish marginal line; ventrals whitish.

Cape York (Castelnau). Sydney (Kner.)

192. CHÆTODON VITTATUS, Bl.

Gunth. Cat. Fishes II., p. 23.—Bleek. Atl. Ichth. Chætod., pl. 15, fig. 1.

D. 13/21. A. 3/20. L. lat. 38. L. transv. 5/13. Vert. 10/14.

Snout short, obtuse, and equal in length to the diameter of the eye; præoperculum very indistinctly serrated; the dorsal and anal fins with the posterior angle rounded. Body with parallel and slightly oblique blackish streaks. Snout blackish, separated from the ocular band by a white streak; the ocular band white-edged, encircling the chest, much narrower than the orbit; a very narrow blackish, anteriorly white-edged stripe behind, and parallel to, the ocular band, along the præopercular margin. A cuneiform, black, yellow edged band from the origin of the soft dorsal to the back of the tail, where it is broadest. A black yellow-e band along the base of the anal fin. The soft dorsal wit indistinct reddish band along its middle. The tail crossed i middle by a black yellow-edged bar; ventrals whitish.

Cape York (Castelnau).

193. CHÆTODON PLEBEJUS, Cuv. & Val.

Gunth. Cat. Fishes II., p. 5.

D. 14/17. A. 4/15. L. lat. 45. L. transv. 6/15.

The snout is rather obtuse, and nearly equal in length t diameter of the eye, præoperculum scarcely denticulated dorsal and anal fins rounded posteriorly. The ocular reaches from the side of the neck to the inferior margin interoperculum, is white-edged, and darker above the eye below. Tail with a large, rounded, blackish, white-edged near its back, immediately below the end of the dorsal.

Sue Island, Torres Straits (Chevert Exp.)

Genus NEOCHÆTODON, Castelnau.

Differs from *Chætodon* in having a bifid tooth on the palat operculum strongly serrated behind and at the rounded and the second anal spine very large.

194. NEOCHÆTODON VITTATUM, Casteln.

Proc. Zool. Soc., Victoria, Vol II., p. 130.

Form oval, high; back gibbous, height of body half the l (without the caudal fin). Eye large, of the length of the s præorbital serrated. Colour light yellow, with six broad, tudinal streaks of a fine black on the body, the two lowe curved downwards; the dorsal fin has a blue band, the oth are yellow.

One specimen three inches long from West Australia.

Count Castelnau suggests that *Chætodon strigatus*, should be placed in the same genus as this species.

Genus CHELMO, Cuv.

Body much compressed and elevated; one dorsal fin with nine or more spines, none elongate. Muzzle produced into a long cylindrical tube, with a small anterior cleft of the mouth. No teeth on the palate, præoperculum without spine. Scales moderate or small.

Indian and Australian Seas.

195. CHELMO ROSTRATUS, Cuv. & Val.

Gunth. Cat. Fishes II., p. 36.—Bleek. Atl. Ichth. Chæt., pl. 7, f. 2.

D. 9/30. A. 3/21. L. lat. 47. L. transv. 9/20. Vert. 10/14.

The length of the snout from the eye is one-half the entire length of the head. Head and body with five brownish cross-bands, edged with brown and white, a round, black, white-edged spot in the middle of the soft dorsal, within the fourth cross band, the fifth band black round the tail.

North-west Coast, Port Essington, Port Darwin and Cape York.

196. CHELMO MARGINALIS, Richards.

Ann. Nat. Hist. 1842, X., p. 29.—Gunth. Cat. Fishes II., p. 36.

D. 9/30. A. 3/21. L. lat. 50. L. transv. 9/22. Cæc. pylor. 5. Vert. 10/14.

Length of snout half that of the head. Head and body with four brownish cross-bands, edged with brown and white; sometimes an indistinct blackish spot in the middle of the soft dorsal, within the third cross-band, the fourth band round the tail.

West Australia. Swan River.

I find that the species mentioned by me in "The Fishes of Port Darwin" (Proc. Linn. Soc. N. S. Wales, Vol. II., p. 352) as

Researches on the Fishes of Australia, p. 14.

The snout is one-half the length of the head; the pr
that part to the base of the dorsal fin is nearly perpe
the dorsal and anal fins are almost truncate behind. T
is yellowish with numerous longitudinal, obscure, narro
on the body; a double band extends from the base of t
through the eye to beneath the operculum, another
further backwards, crosses the posterior part of the op
and extends to the base of the ventral fin; a third for
round the tail. All these bands are formed of two blac
lines, having between them a broader space of the gene
of the body. The soft parts of the dorsal and anal fin
narrow black margin.

Port Darwin. From three to three and a-half inches l

198. **CHELMO LONGIROSTRIS**, Cuv. & Val.

Gunth. Cat. Fishes II., p. 38.—Bleek. Atl. Ichth. Chæt.,

D. 12/23. A. 3/18. L. lat. 75. L. transv. 12/3

The length of the snout is much more than half th
head. A large triangular black patch covering the
upper surface of the head, and the side downwards to
of the inferior margin of the eye; a round black s
posterior angle of the anal fin; caudal blackish.

Cape York (Castelnau)

The length of the snout is not quite half that of the head; dorsal and anal fins angular, truncated posteriorly. Silvery with five black transverse bands, between which are others of a greyish colour.

Port Jackson. King George's Sound.

200. CHELMO TROCHILUS, Gunth.

Ann. Mag. Nat. Hist. 1874, Vol. XIV., p. 368.

D. 11/27. A. 3/8. L. lat. 55.

Body as high as long, head and caudal fin excluded. The length of the snout is contained twice and one-third in that of the head. Anterior part of the soft dorsal and anal fins produced into an acute point, the hind margin of the fins being vertical. Caudal fin truncated. Silvery; head and body with five black transverse bands, the first (the ocular band) much narrower than the orbit, extending from the nape to the interoperculum, and edged with white above the eye; the second, rather broader than the first, runs from the three anterior dorsal spines over the operculum across the chest in front of the ventrals; the third, twice as broad as the second, from the sixth, seventh, and eighth spines to the abdomen, the fourth, between the pointed angles of the dorsal and anal fins; the fifth narrow, round the middle of the free portion of the tail; an indistinct and incomplete cross-band between the first and second, and another between the second and third bands; some irregular blackish spots in the interspaces. Hind-margin of the dorsal and anal fins blackish. Caudal uniform reddish; ventrals black, with yellowish spine.

Australia (Gunther). Seven inches long.

Genus HENIOCHUS.

Differs from *Chætodon* in having the fourth dorsal spine elongate and filiform. Five branchiostegals.

Indian and Australian Seas.

201. HENIOCHUS MACROLEPIDOTUS, Cuv. & Val.

Gunth. Cat. Fishes II., p. 39.—Bleek Atl. Ichth. Chætod., pl.

D. 11/24. A. 3/17. L. lat. 48. L. transv. 10/22. Cæc. pyl
Vert. 10/14.

The fourth dorsal spine exceedingly elongate. A s protuberance above each orbit, none on the neck. The up surface of the snout and a band between the orbits black. Bo with two broad black bands, the anterior from the first fo dorsal spines, touching the hind-margin of the operculum, acro the root of the pectorals to the belly, including the ventra which are deep black; the posterior band from the fifth, sixt and seventh dorsal spines descending obliquely backwards, a occupying the posterior half of the anal fin; the anterior half black-edged.

Port Darwin. Port Essington.

202. HENIOCHUS VARIUS, Cuv. & Val.

Gunther, Cat. Fishes II., p. 41.—Bleeker, Atlas Ichth. Chæt
pl. 3, fig. 2.

D. 11/23. A. 3/17. L. lat. 53.

A protuberance above each orbit, conical and horn-like adult specimens, scarcely visible in young ones; a third, obtu conical, on the nape of the neck. A black band from the or of the dorsal fin, occupying the whole head to the præoperc margins; the second black band nearly entirely suppressing ground colour from the third to the seventh dorsal spines, to belly, and extending from the root of the pectorals and vent to the end of the anal, which like the ventrals is entirely bla

Cape York. (Castelnau, Res. Fishes of Aust., p. 15.)

Genus HOLACANTHUS.

Differs from *Chætodon* in having a strong spine pointing ba wards at the angle of the præoperculum.

All tropical Seas.

203. HOLACANTHUS SEXSTRIATUS, Cuv. & Val.

Gunth. Cat. Fishes II., p. 49.—Bleek. Atlas Ichth. Chætod., pl. 10, fig. 2.

D. 13/18-19. A. 3/18. L. lat. 48. L. transv. 7/25.

The præopercular spine is smooth, and reaches to the base of the pectoral, the dorsal and anal fins are not produced. Head and ventral fins brown; the former with a white vertical band, descending from the nape of the neck, between the eye and præopercular margin to the spine. Body with six brown vertical bands; each scale with the centre darker.

Port Darwin. Cape Grenville (Chevert Exp.)

204. HOLACANTHUS DUBOULAYI, Gunth.

Ann. and Mag. Nat. Hist. 1867, Vol. XX., p. 67.—Macl., Proc. Linn. Soc. N.S. Wales, II., p. 352.

D. 11/23. A. 3/20.

Præopercular spine reaches to the vertical from the hind margin of the operculum. Dorsal and anal fins rounded posteriorly. Head and anterior part of the body yellow, the remainder brown. A very broad ocular band, broader than the eye, descends from the neck to the ventral fins. The brown portion of the body is coarsely reticulated with yellow, the lines descending from the back to the belly. Caudal fin and a cuneiform band along the hinder half of the base of the dorsal, yellow.

North-west Coast. Port Darwin.

Genus SCATOPHAGUS, Cuv. & Val.

Differs from *Chætodon* in having a recumbent spine pointing forwards in front of the dorsal fin, and in having four spines to the anal.

205. SCATOPHAGUS ARGUS, Linn.

Gunth. Cat. Fishes II., p. 58.—Bleek. Alt. Ichth. Chætod., pl. 1, fig. 2.

D. 11/16. A. 4/14. Cæc. pylor. 20. Vert. 11/12.

The width between the eyes is twice and a-third in the length of the head; the length of the fourth dorsal spine is twice and a-half in the height of the body. Præorbital with the lower posterior angle denticulated. Body and vertical fins spotted with brown.

Port Jackson, Brisbane, Cape York.

206. SCATOPAGUS TETRACANTHUS, Lacep.

Gunth. Cat. Fishes II., p. 60.

D. 11/10. A. 4/14.

Brownish with five dark vertical bands.

Port Darwin.

207. SCATOPHAGUS MULTIFASCIATUS, Richards.

Voy. Ereb. and Terr., Fishes, p. 57, pl. 35, f. 4-6.—Gunth. Cat. Fishes II., p. 60.

D. 12/17. A. 4/16.

The width between the eyes is twice and two-thirds in the length of the head; the third dorsal spine is the longest, and is twice and one third in the height of the body. Præorbital with the lower posterior angle minutely serrated. Back with about twelve narrow vertical bands, between which are others still narrower and shorter.

Genus DREPANE, Cuv. & Val.

Body much compressed and elevated. Snout short with the upper profile parabolic. Dorsal fin deeply emarginate with eight spines. Pectorals elongate, falciform. Anal spines three. No præopercular spine.

Indian and Australian Seas.

208. DREPANE PUNCTATA, Cuv. & Val.

at. Fishes II., p. 62.—Bleek. Atl. Ichth. Chætod., pl. 3, fig. 4.

A. 3/18. L. lat. 50. L. transv. 14/33. Cæc. pylor. 2-3.

ird dorsal spine longest, the first of the ventral fin elongate;
ral reaches to or near the root of the caudal. Uniform
ith vertical series of brown specks which are sometimes
.

west Coast. Cape York.

Genus SCORPIS, Cuv. & Val.

ompressed and elevated. Snout moderate. One dorsal
nine or ten spines, anal with three, the soft portions of
sely scaly. Jaws with an outer series of stronger teeth;
the vomer and palatine bones. Seven branchiostegals;
ler present; pyloric appendages in very great number.

Ocean.

209. SCORPIS GEORGIANUS, Cuv. & Val.

Gunth. Cat. Fishes II., p. 64.

D. 9/26. A. 3/27.

ft dorsal and anal fins falcate, the anterior rays being
Uniform brownish.

eorge's Sound.

210. SCORPIS ÆQUIPINNIS, Richards.

bus and Terror, Fishes, p. 121.—Gunth. Cat. Fishes, II., p. 64.

eolatus, Kner., Voy. of Novara., Fishes, p. 108, pl. 5, f. 3.

"*The Sweep*" of the Sydney Fishermen.

D. 10/27. A. 3/27.

The lower margin only of the præoperculum finel
The dorsal and anal fins are not falcate, the ray
gradually shorter posteriorly. Uniform brownish bl

Port Jackson.

211. SCORPIS VINOSA, All. & Macl.

Proc. Linn. Soc. N. S. Wales, Vol. I., p. 277, pl.

Darnley Island (Chevert Exp.)

Genus ATYPUS, Gunth.

Body compressed, oblong. Snout short. Mouth sm
fin with eleven spines, anal with three, the soft porti
covered with scales. Scales rather small, ctenoid.
teeth in the jaws and on the vomer, none on the pala
Præoperculum denticulated. Branchiostegals seven.
bifurcate anteriorly and posteriorly.

Australian Seas.

212. ATYPUS STRIGATUS, Gunth.

Gunth. Cat. II., p. 64.

Atypichthys strigatus, Casteln., Proc. Linn. Soc. N. S. V
p. 375.

D. 11/15-16. A. 3/15-16. L. lat. 70-75. L. tra
Cæc. pylor. 11.

Silvery with five or six brown parallel, longitudinal

Port Jackson. Swan River.

Genus TOXOTES, Cuv.

Body compressed, oblong; snout rather produced
lower jaw longest; eye of moderate size. One dors
five spines, situated on the posterior part of the bac
portion and the anal fin scaly. Villiform teeth in the
the vomer and the palatine bones. Scales of mod

cycloid. Seven branchiostegals; air-bladder simple; pyloric appendages in moderate number.

Indian and Australian Seas.

213. Toxotes jaculator, Cuv. & Val.

Gunth. Cat. Fishes II., p. 67.—Bleek. Atl. Ichth. Chætod., pl. 1, fig. 4.

D. 5/11-13. A. 3/15-17. L. lat. 28. L. transv. 3-4/7-8 Cæc· pylor. 7-9. Vert. 10/14.

The length of the snout equals the width of the space between the eyes. Greenish with broad darker bands or spots across the back.

Port Darwin, Endeavour River.

214. Toxotes carpentariensis, Casteln.

Proc. Linn. Soc. N.S. Wales, Vol. III., p. 47.

Norman River. Gulf of Carpentaria.

Family III. NANDIDÆ.

Perciform Fishes, with an interrupted lateral line.

Genus Plesiops, Cuv.

Body compressed, oblong. Scales moderate. Mouth somewhat protractile. Dorsal fin with eleven or twelve spines, anal with three. Ventral fin with four rays; the first elongate and bifid. Small teeth in the jaws, on the vomer and palatine bones. None of the bones of the head serrated. Six branchiostegals; four gills, pseudobranchiæ; an air-bladder; pyloric appendages none.

Indian and Australian Seas.

215. Plesiops cæruleo-lineatus, Rupp.

Gunth. Cat. Fishes, III., p. 363.

D. 11-12/7. A. 3/8. V. 1/4. L. lat. 23.

The height of the body is contained four or five times in the total length; the length of the head three times and three-quarters. Snout convex. The maxillary extends behind the vertical from the posterior margin of the orbit. Black, each scale with a blue spot; an oblique, blue, longitudinal line on the dorsal and anal fins. Caudal sometimes with a red band, parallel to the margins.

Australia, from Mr. Macgillivray's collection

216. PLESIOPS BLEEKERI, Gunth.

Gunth. Cat. III., p. 364, and Journ. Mus. Godeff. Heft. VII., p. 87, pl. 58, fig. A.

D. 12/9. A. 3/18. P. 18. V. 1/4. L. lat. 45. L. transv. 5/19.

Reddish or yellowish with four broad black bands.

Port Jackson (Macl. Mus.)

Genus TRACHINOPS, Gunth.

Body compressed, elongate. Scales small not ciliated. Mouth not protractile. Dorsal and anal fins long, the former with fourteen, the latter with three spines. Teeth in the jaws, on the vomer and palatine bones; bones of the head not serrated. Five branchiostegals; gills three and a half. Pseudobranchiæ; the gill membranes not united below the throat.

Coasts of Australia.

217. TRACHINOPS TÆNIATUS, Gunth.

Gunth. Cat. III., p. 366.—Kner., Fishes Novara, p. 215, pl. 8, f. 7.

D. 14/16. A. 3/20. L. lat. 62.

Back brownish-black, with a white band running on each side of the base of the dorsal fin.

New South Wales.

Genus Ruppelia, Casteln.

Eye large. Body oblong, scales moderate; opening of mouth oblique and superior; teeth villiform, in several series, the outer series of larger teeth; teeth on the vomer and palatine bones, and also on the tongue, a fleshy filament on each side of the upper lip near the centre; lateral line interrupted; twelve dorsal spines; three anal. Ventrals, one spine and three rays.

218. Ruppelia prolongata, Casteln.

Proc. Zool. Soc, Victoria, II., p. 51.—Res. Fish. Aust. p. 29.

D. 12/10. A. 3/10. V. 1/3. L. lat. 45.

Height twice and three-quarters in the length without caudal fin, head thrice and a-quarter in the same, diameter of the eye four times and a-half in the length of the head. The lower jaw longer than the upper; head without scales and grooved between the eyes, operculum prolonged into a rounded angle near the base of the pectoral fin. The spines of the dorsal increase gradually in length, the twelfth being about twice as long as the second, which is twice the length of the first, the middle rays of the soft dorsal and anal are very much prolonged, reaching to or beyond the caudal; the ventral rays are also elongate. The lateral line terminates at the end of the the soft dorsal fin, but another line is marked in the middle of the side for some distance from the tail; caudal pointed. Colour dark brownish-green, entirely covered with small rounded, light blue spots. Length about twelve inches.

Port Phillip. West Australia.

Count Castelnau classed this Fish with the *Nandidæ*, and therefore I place it here, but I fancy from his description of the genus that it would be more naturally placed among the *Pseudochromidæ*.

FAMILY IV. MULLIDÆ.

Body elongate, slightly compressed, *covered with larg*
Profile of head more or less parabolic; *hyal apparatus wi*
long barbels. Lateral line continuous. Mouth small. Eye
of moderate size. *Four branchiostegals;* pseudobranchiæ. De
feeble. Two dorsal fins remote from each other; anal si
second dorsal. Stomach syphonal.

Genus UPENEOIDES, Bleek.

Teeth in both jaws, on the vomer and palatine bones.

Indian and Australian Seas.

219. UPENEOIDES VITTATUS, Linn.

Gunth. Cat. Fishes I., p. 397.—Bleek. Atl. Ichth. Mull., pl.

D. 8. 1/8. A. 7. L. lat. 39. L. transv. 3/6.

The length of the head is four times and one-fifth in the
the barbels reach to the vertical from the angle of th
operculum; the height of the spinous dorsal is four-fifths
of the body. Body with two or three longitudinal bands, a
golden; the spinous dorsal with the top black, and with
two blackish bands; the upper lobe of the caudal with th
four, the lower with two or three, oblique, black bands.

Endeavour River (Macl. Mus.)

220. UPENEOIDES TRAGULA, Richards.

Gunth. Cat. Fishes I., p. 398.—Bleek. Atl. Ichth. Mull., pl.

D. 8. 1/8. A. 7. L. lat. 30. L. transv. 2/5.

The length of the head is four times and three-fourths in th
length; the barbels do not reach to the vertical from the pos
margin of the præoperculum. The height of the spinous
is three-quarters of that of the body. Vomerine teeth i
lateral strips. Head, body, and anal, pectoral and ventr
sparingly and irregularly spotted with brownish; a

longitudinal band from the snout through the eye to the base of the tail; dorsal fins largely marbled with blackish; each lobe of the caudal fin with five or six oblique, brown cross-bands.

Port Darwin. Palm Islands. Port Jackson.

221. UPENEOIDES TÆNIOPTERUS, Cuv. & Val.

Kner. Voy. Novara, Fishes, p. 68.

D. 8-9. 9. A. 7.

Height of body one-fifth of the total length, the diameter of the eye is one-fourth of the length of the head, and is once and a-quarter in the width of the interorbital space. The colour is red, with a more brilliant red spot at the root of the tail; the fins are marked with brown bands. The second dorsal spine is equal to the distance from the front of the snout to the extreme edge of the præoperculum.

New Holland (Kner.) Length ten inches.

222. UPENEOIDES VLAMINGII, Cuv. & Val.

Gunth. Cat. Fishes I., p. 400.

D. 8. 9. A. 8. Cæc. pylor. 30.

The height of the body equals the length of the head and is three times and two-thirds in the total length. The barbels reach to the angle of the præoperculum. The vomerine teeth are divided into two lateral groups. Red; each scale with a violet speck forming together longitudinal series, snout and cheeks with oblique violet streaks; the second dorsal and anal fins with longitudinal series of violet specks.

Port Jackson. Port Phillip.

223. UPENEOIDES ROSEUS, Casteln.

Researches on the Fishes of Australia, p. 11.

D. 7. 1/8. A. 7.

Height of body four times and a-half in the length without the caudal fin, the head three times and one-third in the same; eye three times and a-third in the length of the head; teeth large and numerous on the vomer and palatine bones; the height of the spinous dorsal less than two-thirds of that of the body. Caudal fin strongly forked. Body pink with the upper parts purple, head above olive; the belly silvery; on each side a broad gold band; fins immaculate, the dorsal, caudal and pectoral fins are olive-yellow, the ventrals flesh-colour; the barbels are long.

Cape York. Specimen five and a-half inches long.

Genus MULLOIDES, Bleek.

Teeth in both jaws in *several* series, none on the vomer or palatine bones.

All tropical seas.

224. MULLOIDES FLAVOLINEATUS, Cuv. & Val.

Gunth. Cat. Fishes I., p. 403.—Bleek. Atl. Ichth. Mull., pl. 4, f. 3.

D. 7. 1/8. A. 8. L. lat, 35-36. L. transv. 2/5-6. Cæc. pylor. 18. Vert. 10/14.

The height of the body is five times and a-third in the total length; the space between the eyes is once and a-half in the length of the snout, and flat; the barbels reach to the vertical from the angle of the præoperculum; the spinous dorsal is nearly as high as the body. A broad citrine band from the eye to the tail; yellow streaks on the tail; fins immaculate.

New Holland (Kner. Voy. of Novara).

Genus UPENEUS, Cuv. & Val.

The teeth in both jaws in a single series, none on the palate.

All tropical seas.

225. Upeneus barberinus, Cuv. & Val.

Gunth. Cat. Fishes I., p. 405.—Bleek. Atl. Ichth. Mull. pl. 3, f. 1.

D. 8. 9. A. 7. L. lat. 29-31. L. transv. 2/7. Vert. 10/14.

The height of the body is four times and a-third in the total length; the distance between the eyes is one half of the length of the snout; the barbels reach slightly beyond the vertical from the angle of the præoperculum. A black band from the eye along the lateral line to below the anterior half of the second dorsal; a round black spot on each side of the root of the caudal.

New Holland (Kner., Fishes of the Novara).

226. Upeneus malabaricus, Cuv. & Val.

Gunth. Cat. Fishes I., p. 407.—All. & Macl. Proc. Linn. Soc. N.S. Wales, Vol. I., p. 274.

D. 7. 1/9. A. 7. L. lat. 30. L. transv. 3/7.

The barbels reach beyond the angle of the præoperculum. A large ovate white spot on the lateral line above the extremity of the pectoral fin; a black spot on each side of the root of the tail.

Cape Grenville (Chevert Exp.)

227. Upeneus porosus, Cuv. & Val.

Gunth. Cat. Fishes I., p. 400.—Ann. and Mag. Nat. Hist. 1867, Vol. XX., p. 59.

D. 8. 1/8. A. 7. L. lat. 30.

Body elevated anteriorly, about a third of the length. Snout twice as long as the eye. The barbels extend to the vertical from the hind margin of the operculum. Two silvery streaks between the eye and the mouth; parts above the lateral line clouded with darker; spinous dorsal blackish.

Port Jackson, Port Phillip, and Tasmania.

228. UPENEUS SIGNATUS, Gunth.

Ann. and Mag. Nat. Hist. 1867, Vol. XX., p. 59.

D. 8. 1/8. A. 1/6. L. lat. 30-31.

The height of the body is contained thrice or thrice and one-third in the length (without caudal). Head not much longer than deep, snout only twice as long as the diameter of the eye. Barbels extending to the hind margin of the præoperculum. Dorsal spines flexible at the top. Tubes of the lateral line with rather long lateral branchlets, in small number. Coloration as in *U. barbarinus*, but with the black caudal spot large, square, and extending over the back of the tail; a whitish blotch in front of it.

Port Jackson.

FAMILY V. SPARIDÆ.

Perciform fish with either incisor teeth in front of the jaws, or lateral series of molar teeth.

1.—*Incisor teeth, vegetable feeders.*

Genus PACHYMETOPON, Gunth.

Behind the incisor teeth in each jaw, a similar band, but less developed, and replacing the former. No molars; no teeth on the palate. Dorsal and anal fins partly, caudal entirely, hidden by scales. Dorsal without notch and with eleven spines, scales moderate, cheek scaly.

Australian Seas.

229. PACHYMETOPON GRANDE, Gunth.

Gunth. Cat. Fishes I., p. 424, pl. 26.

D. 11/11. A. 3/10. L. lat. 88. L. transv. 11/22.

A large and convex transverse protuberance between the eyes. Coloration uniform greyish, with the fins blackish.

I think that a fish in my Museum, taken in Port Jackson is this species. Dr. Gunther when he described it was not acquainted with its "habitat."

230. PACHYMETOPON SQUAMOSUM, All. & Macl.

Proc. Linn. Soc. N. S. Wales, Vol. I., p. 275, pl. 9, fig. 1.

Torres Straits, South Coast of New Guinea.

Genus GIRELLA, Gray.

Incisors generally tricuspid. Cheeks scaly; opercles naked, except the upper angle of the operculum. Dorsal spines can be received into a rather incomplete groove. Scales moderate. Six branchiostegals. Pyloric appendages in great number; air-bladder divided into two posterior horns.

Chinese and Australian Seas.

231. GIRELLA TRICUSPIDATA, Cuv. & Val.

Gunth. Cat. Fishes I., p. 428.—Richards, Ereb. and Terr., Fishes, p. 36, pl. 25, f. 2.

"*Black Fish*" of the Sydney Fishermen.

D. 15/11-12. A. 3/11 12. L. lat. 50. L. transv. 10/20. Vert. 11/16.

The length of the head is four times and two-thirds in the total length; dorsal fin moderately high, the spinous portion lower than the soft, the incisors three-pointed, moderately broad, imbricate, in several series in the upper, in two in the lower jaw. Uniform brownish.

Port Jackson, Victorian and New South Wales Coasts.

232. GIRELLA SIMPLEX, Richards.

Voy. Ereb. and Terr., Fish., p. 25.—Gunth. Cat. Fishes, I., p. 429.

D. 15-14/12-13. A. 3/12. L. lat. 55. L trans. 11/20.

The length of the head is one-fifth of the total length; dorsal fin of moderate height, the spinous portion about as high as the soft; the incisors with the cutting margin entire, moder broad, imbricate, above and below in two or three irreg series. A short series of teeth on the anterior portion of palatine bones. Uniform brownish or blackish.

Port Jackson. Port Phillip.

233. GIRELLA ZONATA, Gunth.

Gunth. Cat. Fishes, I., p. 429, pl. 27.

D. 14/14. A. 3/11. L. lat. 49. L. transv. 9/17.

In both jaws a pluriserial band of narrow tricuspid t separated from a posterior band of similar teeth by a gr Brown (in spirits) with a vertical lighter zone across the mi of the back; the vertical fins and the ventrals blackish.

Australian Seas ? (Gunther).

234. GIRELLA BLACKII, Casteln.

Proc. Zool. Soc., Victoria, Vol. II., p. 41.

D. 15/12. A. 3/12. L. lat. 53-54. L. transv. 32.

Body oval, its height contained three-times in the total ler head four and a-half times in the same, diameter of the eye fourth of the length of the head; teeth with three points; operculum scaly; operculum naked, except on its upper ext portion. The soft dorsal fin is higher than the spinous. C in dried specimen uniform light brown, with the lower parts yellow.

Port Phillip. Four inches and a-half in length.

235. GIRELLA ELEVATA, *n. sp.*

"The Drummer."

D. 13/12. A. 3/10.

Height of body more than a third of the total length; le of head one-fifth. Teeth tricuspid, the middle cusp large rounded, a few conical looking teeth on the side of the intermaxillary bone behind. Scales large except on the occiput; dorsal spines strong, shorter than the rays; anal spines strong, gradually increasing in length, but much shorter than the rays. Tail large, slightly emarginate; pectoral fins about as long as the head. Uniform brown.

Port Jackson.

236. GIRELLA CYANEA, *n. sp.*

"*Blue Fish.*"

D. 15/12. A. 3/10.

Height of body three times and two-thirds in the total length, head nearly one-fifth; teeth evenly tricuspid, smaller ones on the sides, spinous and soft dorsal of about equal height; the second anal spine stronger and a little shorter than the third; tail strongly forked. Colour deep blue.

237. GIRELLA RAMSAYI, *n. sp.*

D. 15/12. A. 2/12.

Height of body three times and a-half in the total length; length of head five times. Eye large. Forhead broad, smooth, very slightly convex and more than twice the diameter of the orbit; length of snout twice the diameter of the orbit. Teeth small, tricuspid, none on the vomer. Upper lip fleshy, the maxillary entirely covered by the præorbital when the mouth is shut, and reaching to the vertical from the first nostril; the præorbital is a little emarginate in front. Scales rather large; those on the cheek very minute, and on the throat and chest entirely embedded in the skin. Dorsal fin nearly even throughout; the second spine of the anal very strong, more than twice the length of the first, and much shorter than the rays; tail considerably emarginated. Coloration slaty-brown above and on the sides, white on the belly; muzzle, chin, and round the eyes bright yellow. Length eighteen inches.

Port Jackson.

Genus TEPHRÆOPS, Gunth.

Like *Girella,* but with very small scales.

238. TEPHRÆOPS RICHARDSONI, Gunth.

Gunth. Cat. Fishes, I., p. 432.

Crenidens tephræops, Richards, Voy. Erebus and Terror, p. 69, pl. 41, fig. 1.

D. 14/13. A. 3/11.

In front of the jaws a single series of tricuspid teeth, separated from the broad posterior band of smaller ones by a groove; anal fin rather elevated, the second ray being four-fifths of the length of the head. Uniform blackish.

King George's Sound.

Genus NEOTEPHRÆOPS, Casteln.

Like *Tephræops,* but with the operculum as well as the præoperculum covered with scales.

Australian Seas.

239. NEOTEPHRÆOPS ZEBRA, Richards.

Crenidens zebra, Richards, Erebus and Terror, Fishes, p. 70.

Tephræops zebra, Gunth., Cat. Fishes, I., p. 432.

Neotephræops zebra, Casteln., Proc. Zool. Soc., Vict., Vol. I., p. 69.

D. 14/13. A. 3/12. L. lat. 79. L. transv. 61.

Body oval; the height about three and a-third times in the total length, the head nearly five times in the same. Coloration dark grey or black, with nine broad darker bars descending from the back.

King George's Sound.

Genus HAPLODACTYLUS, Cuv. & Val.

In both jaws series of flat and generally tricuspid teeth, behind which is a band of small cardiform teeth; vomerine teeth. Cheeks and opercles scaly. Two elongate dorsal fins; anal short; the lower pectoral rays simple. Scales very small. Five or six branchiostegals, pyloric appendages in small number. Air-bladder simple.

Southern Pacific.

240. HAPLODACTYLUS ARCTIDENS, Richards.

Gunth. Cat. Fishes I., p. 335.

D. 16. 1/18. A. 3/7. Cæc. pylor. 4. Vert. 16/18. ?

Incisors lanceolate without distinct lobes in old age. Six simple pectoral rays, Uniform brownish.

Port Arthur, Tasmania.

241. HAPLODACTYLUS LOPHODON, Gunth.

B. 5. D. 17/20. A. 3/6. L. lat. 78.

Each incisor with a terminal lobe and two lateral lobes on each side. Six simple pectoral rays. Brown: operculum with a black spot behind; caudal and anal fins variegated with lighter.

Coast of New South Wales. Port Jackson.

242. HAPLODACTYLUS OBSCURUS, Casteln.

Proc. Linn. Soc. N. S. Wales, Vol. III., p. 374.

Port Jackson.

2. *Molar lateral teeth in the jaws. Carnivorous.*

Genus LETHRINUS, Cuv.

Cheeks naked. Cardiform teeth in front of the jaws with the addition of canines, lateral teeth in a single series—conical, or conical and molar-like, or obtuse molars. Scales moderate. Six branchiostegals. Air-bladder generally notched posteriorly, and with short lateral appendages.

Indian and Australian Seas.

243. LETHRINUS NEMATACANTHUS, Bleek.

Gunth. Cat. Fishes I., p. 456.—Bleek. Atl. Ichth. Perc., pl. 39, f. 3.

D. 10/9. A. 3/8. L. lat. 48.

The height of the body is nearly four times in the total length, the length of the head four times to three and three-quarters; the snout is slightly elongate and pointed; the diameter of the eye is once and a-half in the length of the snout. The maxillary bone reaches to or nearly to the vertical from the anterior margin of the eye. Canine teeth moderate, the lateral teeth conical. Dorsal spines slender: the second longest, flexible, longer than the longest ray and than half the length of the head. Tail slightly emarginate. Olive, shining-golden, with four or five orange-coloured longitudinal bands, head and body with indistinct and irregular brownish spots, a blackish blotch between the pectoral fin and the lateral line; spines and rays of the fins (except the pectoral) with brownish spots.

North-east Coast. Percy Islands. Port Jackson. (Macl. Mus.)

244. LETHRINUS CHRYSOSTOMUS, Richards.

Voy. Erebus and Terror Fishes. pl. 60, f. 6-7.—Gunth. Cat. Fishes I., p. 457.

D. 10/9. A. 3/8. L. lat. 48. L. transv. 5/16.

The height of the body is three times in the total length, the length of the head three and a-quarter. The snout is elongate and pointed, and the eye, in adult specimens, of rather small size, its diameter being less than the distance between the eyes, or nearly one-third of the length of the snout. The maxillary bone reaches to the vertical from the posterior nostril. Canine teeth rather strong; the lateral teeth conical and pointed. Dorsal spines moderate; the third rather shorter than the longest ray, and three times and a-half in the length of the head. Olive; each scale of the back and sides with a black vertical streak at its base; head, and dorsal, caudal, anal and ventral fins blackish-brown; the caudal variegated with lighter.

Norfolk Island, Cape York, Percy Islands, &c.

245. LETHRINUS RICHARDSONII, Gunth.

Gunth. Cat. Fishes I., p. 458.

Lethrinus hæmatopterus, Bleek, Atl. Ichth. Perc., pl. 53, fig. 4.

D. 10/9. A. 3/8. L. lat. 48. L. transv. 5/17.

The height of the body is three times to three and a-half in the total length, the length of the head three and a-half times. The snout is slightly elongate and pointed; the diameter of the eye is rather more than the width between the orbits, and once and a-half to once and two-thirds in the length of the snout. The maxillary reaches to the vertical from the anterior nostril. Canine teeth rather small, those of the lateral series conical, none molar-like. Dorsal and anal spines rather stout, the fourth and fifth dorsal longest, but shorter than the rays and about twice and a-half in the length of the head. Caudal fin emarginate. Brownish-olive (in spirits) indistinctly marked with darker, a black roundish blotch between the lateral line and the pectoral fin. (These markings are not represented in Dr. Bleeker's figure).

Cape York (Gunther).

246. LETHRINUS LATICAUDIS, All. & Macl.

Proc. Linn. Soc. N.S. Wales, Vol. I., p. 276, pl. 8, fig. 2.

Percy Islands (Chevert Exp.)

247. LETHRINUS PAPUENSIS, All. & Macl.

Proc. Linn. Soc. N. S. Wales, Vol. I., p. 276, pl. 8, fig. 1.

South Coast of New Guinea (Chevert Exp.)

248. Lethrinus fusciceps, Macl.

Proc. Linn. Soc. N. S. Wales, Vol. II., p. 350, pl. 8, fig.

Port Darwin.

249. Lethrinus punctulatus, Macl.

Proc. Linn. Soc. N. S. Wales, Vol. II., p. 351, pl. 8, fig.

Port Darwin.

250. Lethrinus harak, Forsk.

Gunth. Cat. Fishes I., p. 458.—Bleek. Atl. Ichth. Perc., pl. 49

D. 10/9. A. 3/8. L. lat. 47. L. transv. 6/14.

The height of the body is three times and a-half in the length, the length of the head four times; the snout moder elongate and pointed. The diameter of the eye is greater the distance between the eyes, and once and three-fourths i length of the snout. There is a slight protuberance before upper anterior angle of the eye; the maxillary reaches to vertical from the anterior nostril. Canine and molar t moderate. Dorsal spines rather feeble; the fourth, lon rather shorter than the highest ray and twice and three-fo in the length of the head. Caudal fin slightly emargi Greenish-olive, with an oblong lateral blotch of a blackish c below the lateral line and below the middle of the dorsal fin

Sydney (Kner, Fishes of the Novara).

251. Lethrinus cocosensis, Bleek.

Gunth. Cat. Fishes I., p. 59.—Bleek. Atl. Ichth. Perc., pl. 18,

L. sordidus and *fasciatus*, Cuv. & Val.

D. 10/9. A. 3/8. L. lat. 50.

Height of body four times in the total length, the leng of the head three times and five-sixths. The diameter of th is thrice and a-half in the length of the head, and more tha distance between the eyes. The snout is longer than the and the maxillary does not reach to the vertical from the anterior margin of the eye. The posterior teeth are molars; canines moderate. The fifth dorsal spine longest, one-third shorter than the height of the body and shorter than the rays. Caudal fin forked with pointed lobes. Olive, with reddish or orange coloured longitudinal bands and with four or five five brown transverse ones. Fins immaculate, reddish-yellow, the spinous dorsal brown-edged

New Holland (Kner. Fish. Novara).

252. LETHRINUS GLYPHODON, Gunth.

Gunth. Cat. Fishes I., p. 462.—Castelnau, Proc. Linn. Soc. N.S. Wales, Vol. III., p. 372.

Port Jackson.

Genus NEOLETHRINUS, Casteln.

Like *Lethrinus*, but with the palate and all the inside of the mouth, covered with small molar teeth.

253. NEOLETHRINUS SIMILIS, Casteln.

Castelnau, Researches on the Fishes of Australia, p. 12.

D. 10/9. A. 3/8. L. lat. 52.

The height of the body is equal to the length of the head, and is contained twice and two-thirds in the length (caudal excluded). The eye is about three times and a-third in the length of the head, the mouth is rather extensible and pointed, with the cleft oblique. The caudal fin is bilobed. The general colour is grey, the head rather purple with ocellated round white spots on the cheeks; there is a large square, obscure spot on most of the scales at the back; on the lower part of the body there are traces of two or three slight longitudinal stripes of a yellow tinge; throat white, fins transparent, rather yellow; membranes of the dorsal rather nebulous. Length four inches.

Cape York.

Genus SPHÆRODON, Rupp.

Jaws with several conical canine-like teeth in front, and a single series of molars on the sides. Cheeks scaly. Dor with ten spines, which can be received in a groove. moderate. Six branchiostegals. Pyloric appendages in number.

Indian and Australian Seas.

254. SPHÆRODON GRANDOCULIS, Rupp.

Gunth. Cat. Fishes I., p. 465.—Mus. Godeff. Journ. Heft 7,

SYN.—*Sphærodon heterodon*, Bleek., *Lethrinus latidens*, C.

Sphærodon latidens, Kner., Fishes of Novara, p. 83, pl. 4,

D. 10/10. A. 3/9. L. lat. 46. L. transv. 5/16. Cæc. py
Vert. 10/14.

Eyes large. The dorsal spines equal on both sides, the anal spine longest; the spinous dorsal with two series of spots, some of the rays of the dorsal and anal fins with a spot behind their base.

New Holland (Kner, Fishes of Novara).

Genus PAGRUS, Cuv.

Similar pairs of strong, conical, canine like teeth in the series of both the jaws; molars in two series. Cheeks The spines of the dorsal are sometimes elongate, and received in a groove. Scales moderate. Six branchios Pyloric appendages in small number. Air-bladder simple

All Seas.

255. PAGRUS UNICOLOR, Cuv. & Val.

Gunth. Cat. Fishes I., p. 468.

Schnapper of the Fishermen.

D. 12/10. A. 3/8. L. lat. 52. L. trans. 8/17. Cæc. py

The height of the body is twice and two-thirds in th length, the length of the head thrice and a-half; the diam the eye equals the distance between the eyes, and is once and a-third in the length of the snout; a slight protuberance above the upper anterior angle of the eye; the præorbital is one and two-third times as long as high; there are six or seven series of scales on the præoperculum. Dorsal spines not elongate; the second anal spine rather longer but not stronger than the third, one-third of the length of the head; the pectoral reaches to the third anal spine. Silvery; back darker with silvery specks, sometimes disappearing in preserved specimens.

All Australian Seas.

256. PAGRUS MAJOR, Temm.

Gunth. Cat. Fishes I., p. 470.

D. 12/10. A. 3/8. L. lat. 55. L. transv. 7/15.

The distance between the eyes equals their diameter, which is once and a-half in the length of the snout. The præorbital is once and one-third as long as high, a slight protuberance before the upper anterior angle of the eye. Limb of præoperculum naked. Dorsal spines moderate, slightly compressed on one side, the fourth longest; the second anal spine rather stronger but not longer than the third, which is one-third of the length of the head. Molars small in two series, sometimes with a third of rudimentary teeth. Uniform reddish.

West Coast of Australia.

Genus CHRYSOPHRYS, Cuv.

Four or six conical canine teeth and three or more series of rounded molar teeth in both jaws. Cheeks scaly. The spines of the dorsal can be received in a groove. Scales moderate. Six branchiostegals; pyloric appendages in small number; air-bladder sometimes notched or with very short appendages.

All Seas.

257. CHRYSOPHRYS SARBA, Forsk.,

Gunther Cat. Fishes I., p. 188.

"*Tarwhine*" of the Fishermen.

D. 11/12-13. A. 3/11. L. lat. 55. L. transv. 7/1

The height of the body is twice and two-thirds in th
length, the length of the head four times ; the distance b
the eyes is rather more than their diameter, which is on
two-thirds in the length of the snout. The præorbital is on
a-third as long as high ; a slight protuberance above the
anterior angle of the eye. Incisors broad, obtuse ; the mo
great number forming four series in both jaws, a large
molar behind. Dorsal spines moderate, rather comp
broader on one side, the fourth longest ; the second and
anal spines nearly equal, twice and three-quarters in the
of the head. Silvery, with about fourteen indistinct longit
streaks in preserved specimens.

Port Jackson.

258. CHRYSOPHRYS HASTA, Bl.

Gunth. Cat. Fishes I., p. 490.—Bleek. Atl. Ichth. Perc., pl. 6

D. 11-12/10. A. 3/8-9. L. lat. 42-45. L. transv. 4-5

The height of the body is twice and two-thirds in the
length, the length of the head thrice and two-thirds. In
the eye is once and three-quarters in the width of the fo
and twice in the length of the snout. The præorbital is t
long as high and is notched to receive the extremity
maxillary bone. Incisors conical, pointed, of moderate str
molars in great number, above in four or five series, bene
three or four. Dorsal spines strong, compressed, broader
side, the fourth longest, once and a-half in the length of the
Operculum with a rather prominent spine. Silvery, a
blackish, dorsal edged with blackish.

Port Darwin.

259. Chrysophrys australis, Gunth.

Gunth. Cat. Fishes I., p. 494, pl. 28, fig. B.

"*Black Bream*" of the Sydney Market.

D. 11/10-11. A. 3/8. L. lat. 44-45. L. transv. 5/13.

The height of the body is nearly one-third of the total length, the length of the head one-fourth. The diameter of the eye is four times and two-thirds in the latter, and one and a-half in the length of the snout. Molars in four series in the upper, and three in the lower jaw, the posterior ones largest. The præorbital is rather lower than the orbit. There are five series of scales between the præorbital and the angle of the præoperculum. Dorsal spines strong, the fourth longest, nearly half the length of the head. The second anal spine is very strong, equal in length to the fourth of the dorsal. Silvery, with shining golden longitudinal streaks, edge of the spinous dorsal and axil black.

Port Jackson, Port Phillip &c.

Family VI. HOPLOGNATHIDÆ.

Perciform Fishes, with the teeth of the jaws confluent into a cutting lamella.

Genus Hoplognathus, Richards.

The spinous dorsal with twelve spines, the soft dorsal and anal fins rather elevated; vertical fins scaly on the basal portion.

Indian and Australian Seas.

260. Hoplognathus conwayii, Richards.

Gunth. Cat. Fishes III., p. 357.

D. 12/12. A. 3/12.

The length of the fifth and sixth dorsal spines is three times and a-third in the length of the head.

Australia ? (Gunther).

FAMILY VII. CIRRHITIDÆ.

Perciform fishes with the lower pectoral rays not branched
with neither trenchant nor molar teeth in the jaws.

Genus NEOCIRRHITES, Casteln.

Almost identical with Bleeker's genus *Cirrhilichthys*, but
no canine teeth in the upper jaw. The lower jaw is cro
with small villiform teeth, with the canines strong and c
backwards. Six simple pectoral rays. Teeth on the pa
præoperculum armed.

261. NEOCIRRHITES ARMATUS, Casteln.

Proc. Zool. Soc., Victoria, Vol. II., p. 101.

D. 10/13. A. 3/? L. lat. 43. L. transv. 16.

Form broad, oval, compressed, upper profile very co
height a little over twice and a third in the total length
fish; head four times in the same; eye twice and a-half i
length of the head, upper jaw a little longer than the l
Cheeks scaly, præoperculum with a series of rather long s
at the angle. Operculum with a notch behind and coverin
base of the pectorals, the suprascapula serrated. Scales r
large. Dorsal spines about equal, excepting the first wh
short; the second anal spine rather longer than the third
simple rays of the pectorals are thick and longer than the o
extending to the extremity of the ventrals. The dorsal
received in a scaly sheath in which the spines lay altern
forming two rows. The colour is a light yellowish brown
the back darker. Length two inches.

Knob Island, Torres Straits.

Genus CHIRONEMUS, Cuv. & Val.

Six or seven lower pectoral rays simple; dorsal fin with f
spines. Villiform teeth in both jaws, without canines; tee

the vomer, none on the palatines. Six branchiostegals. Præoperculum entire; operculum with points. Scales moderate. Air-bladder none; pyloric appendages in small number.

Australian Seas.

262. CHIRONEMUS GEORGIANUS, Cuv. & Val.

Gunth. Cat. Fishes II., p. 76.

D. 15/16. A. 3/7. Cæc. pylor. 4.

Seven simple pectoral rays, the base of the soft dorsal half as long as that of the spinous.

King George's Sound.

263. CHIRONEMUS MARMORATUS, Gunth.

Gunth. Cat. Fishes II., p. 76.

D. 14. 1/18. A. 3/6. L. lat. 55.

Six simple pectoral rays; the base of the soft dorsal rather shorter than that of the spinous; the fifth dorsal spine longest. Yellowish, largely marbled with dark brown; the spinous dorsal blackish, the other fins spotted with brown.

Western Australia, Darnley Island, Port Jackson.

264. CHIRONEMUS MACULOSUS, Richards.

Threpterius maculosus, Richards, Proc. Zool. Soc., 1850, p. 70, pl. 2, fig. 1-2.

Chironemus maculosus, Gunth., Cat. Fishes II., p. 78.

D. 14/18. A. 3/7. L. lat. 52.

The length of the base of the soft dorsal fin is two-thirds of that of the spinous. Seven simple pectoral rays; præorbital narrow; membrane between the dorsal spines deeply notched, and produced into a small free lobe behind each spine. Pale brown: head, body, and the soft dorsal, caudal and anal fins spotted with blackish.

King George's Sound.

rays more or less exceeding the fin in length. Teeth in v
bands, no canines, no teeth on the vomer or palatine
Præorbital and præoperculum entire. Scales moderate.
scaly. Six or five branchiostegals. Air-bladder with mar
generally; pyloric appendages in small number.

Temperate regions of the Pacific. South Africa.

265. CHILODACTYLUS VITTATUS, Garrett.

Gunth. Jour. Mus. Godeff. Heft. 7, p. 73, pl. 51, fig.

Zeodrius vittatus, Castel., Proc. Linn. Soc. N.S. Wales, V
p. 377.

Port Jackson.

Count Castelnau's species from Sydney is evidently th
as Gunther's from the Sandwich Islands, the only disparit
in Castelnau's describing the dorsal fin as having only o
spine in front of the long one, which is clearly a mistake

266. CHILODACTYLUS CARPONEMUS, Cuv. & Val.

Gunth. Cat. Fishes II., p. 78.

B. 6. D. 17/31. A. 3/19. Cœc. pylor. 2.

Seven rays of the pectoral simple, the longest reaching
to the end of the anal, and one-third of the total length.
fin scarcely notched. Coloration uniform, the caudal f

D. 17/26. A. 3/14. L. lat. 55. L. transv. 6/17.

Six simple pectoral rays, the uppermost very elongate, reaching to the fourth soft ray of the anal; dorsal fin notched, the seventh spine longest, higher than the soft dorsal, and one half the length of the head; the second anal spine strong, and longer than the third. A blackish band from the origin of the dorsal to the shoulder and the base of the pectoral.

Port Jackson, Tasmania, Port Phillip.

268. Chilodactylus aspersus, Richards.

Ann. and Mag. Nat. Hist. 1851, Vol. VII, p. 230.—Gunth. Cat. Fishes II., p. 79.

D. 18/27. A. 3/11. L. lat. 55-57. L. transv. 6/15.

Six simple pectoral rays, the uppermost very elongate, reaching beyond the origin of the soft anal. The spines of the fins are strong, the fifth of the dorsal longest, higher than the soft dorsal and twice and four-fifths in the length of the head. Brownish with scattered black specks.

Tasmania.

269. Chilodactylus nigricans, Richards.

Ann. and Mag. Nát. Hist. 1851, Vol. VII., p. 279.—Gunth. Cat. Fishes II., p. 79.

D. 15/26. A. 3/10. L. lat. 48.

Five simple pectoral rays; the uppermost longest, projecting only about one-sixth of its length beyond the membrane; the sixth dorsal spine is the longest, equals one-third of the height of the body, and is higher than the soft rays, which rise considerably above the posterior spines. Uniform blackish-grey.

King George's Sound.

270. CHILODACTYLUS NIGRIPES, Richards.

Ann. and Mag. Nat. Hist. 1851, Vol. VII., p. 381.—Gunth
Fishes II., p. 82.

D. 18/26. A. 3/10. L. lat. 61.

Five simple pectoral rays, the second longest, not reachin vent, and projecting about a third of its length beyon membrane. Dorsal fin notched, the fifth and longest sp more than one-third the height of the body. An eminence the upper angle of the orbit. Fins black.

King George's Sound.

271. CHILODACTYLUS GIBBOSUS, Richards.

Gunth. Cat. Fishes II., p. 84.

D. 17/33. A. 3/9. L. lat. 63.

Five simple pectoral rays of moderate length, the second third longest. Dorsal fin slightly notched, the fourth and spines elongate, the former equal to the length of the hea old specimens a pair of horns on the forehead, and a pair of tubercles on the snout. A blackish longitudinal band bet the dorsal and the lateral line.

West Australia, Tasmania, Port Phillip.

272. CHILODACTYLUS SPECTABILIS, Hutton.

Fishes of New Zealand, p. 8, 1872.

Chilodactylus Allporti, Gunth., Ann. Nat. Hist. 1872, Vol
p. 184.

Chilodactylus rubrofasciatus, Casteln., Proc. Linn. Soc. N.S.
Vol. III., p. 140.

D. 17/26. A. 3/9. L. lat. 55. L. transv. 5/16.

Total length about four and a-quarter times the length head, and rather more than three times the height of the Six simple pectoral rays, the upper one the longest, not so as the head, and not extending to the end of the ventrals, the others graduated. Dorsal deeply notched, the fourth, fifth, and sixth spines about equal and longest, rather more than one-third of the length of the head. Back and sides yellowish-orange, with six transverse bands of reddish orange; belly yellowish white, dorsal fin blackish.

Tasmania, Port Phillip.

273. CHILODACTYLUS FUSCUS, Casteln.

Proc. Linn. Soc. N.S. Wales, Vol. III., p. 376.

The "*Carp*" of the Sydney Fishermen.

Port Jackson.

274. CHILODACTYLUS ANNULARIS, Casteln.

Proc. Linn. Soc., N. S. Wales, Vol. III., p. 377.

Port Jackson.

Genus NEMODACTYLUS, Richards.

One dorsal fin with seventeen spines; the anal of moderate length, the caudal forked; one of the simple pectoral rays elongate. A single series of minute teeth in the jaws; no other teeth. Præorbital and præoperculum entire. Scales thin, cycloid, of moderate size. Cheeks naked. Three branchiostegals. Pyloric appendages in small number.

Tasmania.

275. NEMADACTYLUS CONCINNUS, Richards.

Trans. Zool. Soc. III., p. 116, pl. 4, f. 2.—Gunth. Cat. Fishes II., p. 85.

D. 17/28. A. 3/15. L. lat. 50. Cæc. pylor. 4. Vert. 34.

Coloration uniform. The longest simple pectoral ray projects nearly one-fourth of its length beyond the membrane.

Port Arthur, Tasmania.

Genus LATRIS, Richards.

Dorsal fin deeply notched, with seventeen spines; anal elongate; none of the simple rays of the pectoral elongate. Teeth villiform in both jaws; no canines. Præorbital entire; præoperculum minutely ciliated. Scales small. Cheeks scaly. Six branchiostegals. Pyloric appendages in small number.

Australia and New Zealand.

276. LATIRIS HECATEIA, Richards.

Trans. Zool. Soc. III., p. 106, pl. 6, f. 1.—Gunth. Cat. Fish. II., p. 86.

Hobart Town "Trumpeter."

D. 18/36. A. 3/27. V. 1/4. L. lat. 110. Cæc. pylor. 4. Vert. 14/20.

The length of the head is one-fourth of the total, the lower nine pectoral rays simple. Vomerine teeth. Back and sides brown, with four straight whitish longitudinal bands.

Tasmania, Port Phillip.

277. LATRIS CILIARIS, Forst.

Rich. Ereb. & Terr., p. 37, pl. 26, f. 6-7.—Gunth. Cat. Fishes II., p. 86.

D. 17/39. A. 3/32. L. lat. 84.

The length of the head is one-fifth of the total; six simple pectoral rays. Vomerine teeth none.

Port Jackson.

278. LATRIS FORSTERI, Casteln.

Proc. Zool. Soc., Victoria, Vol. I., p. 77.

The "*Bastard Trumpeter*" of the Melbourne Fishermen.

D. 17/40. A. 2/38. L. lat. 120.

Height of body not quite three-times in the total length, head four times and a-half in the same, eye four times and a-half in the length of the head. Form, a regular oval; top of head and snout without scales; the fourth and fifth dorsal spines longest. Caudal fin strongly forked; ventrals small, placed considerably behind the pectorals. Head yellow in front and green behind the eyes, with the sides purple, the mouth and throat are of a fine pink, the back light purplish blue, with numerous narrow longitudinal golden bands, the lower parts of the body whitish-pink. The dorsal fin is reddish with a darker margin, the anal similar; the caudal and ventrals are rather dark coloured, pectorals yellowish. Eyes orange.

Port Phillip. Gippsland Coast.

279. LATRIS BILINEATA, Casteln.

Proc. Zool. Soc., Victoria, Vol. I., p. 79.

D. 15/41. A. 2/35.

Form and proportions the same as in *L. Forsteri*, the fourth anal ray prolonged into a filament. Colour silvery with the back blue; two longitudinal broad golden bands on the sides; towards the middle of the height there is a longitudinal impression like a second lateral line, the inside of the mouth and throat are black.

From Western Port. Length seven inches.

280. LATRIS INORNATA, Casteln.

Proc. Zool. Soc., Victoria, Vol. I., p. 79.

D. 16. 1/40. C. 15. P. 19.

Profile oval; height of body three times and one-third in the total length, the head four times and one-third. The spinous dorsal higher than the soft, the fifth, sixth and seventh spines being the longest; caudal fin strongly forked; general colour bluish silvery-white, with the back and upper part of the head a deep blue black, which extends to the lateral line, where it ceases at once without any graduation or shade; at this line there is a a bluish tinge; a black spot on the upper part of the o

Western Port. Length six and a-half inches.

Genus Lacepedia, Casteln.

Præoperculum strongly serrated, operculum with point. Teeth numerous and cardiform in the jaws wit teeth on the vomer and palatine bones. One dorsal.] pectorals large, some of the rays simple.

281. Lacepedia cataphracta, Casteln.

Proc. Zool. Soc., Victoria, Vol. II., p. 43.

D. 11/22. A. 3/10. L. lat. 56. L. transv. 2

Form rather high and convex above, mouth oblique, jaw longest; head covered with elevated scales; scales r large and triangular looking. Spinous dorsal low and third anal spine the longest. Caudal bilobed; ventral below the pectorals; the pectoral rays are thick, an two lowest simple. The height of the body is twice a in the length without the caudal, the head three ti quarter in the same; and the eye is a little over one the length of the head. Colour in a dried state, unif yellowish-brown.

Described from one injured specimen about seven

Genus SEBASTES, Cuv. & Val.

Head and body compressed, above scaly, to or beyond the orbits, *without groove on the occiput*, generally with a few small spines; præoperculum armed; body covered with scales of moderate or small size; no skinny appendages. Fins not elongate; one dorsal, separated by a notch into a spinous and soft portion, with twelve or thirteen spines; anal fin with three. No pectoral appendages. Villiform teeth in the jaws, on the vomer and generally on the palatine bones. Seven branchiostegals. Air-bladder mostly present; pyloric appendages in moderate or small number.

In nearly all seas.

282. SEBASTES PERCOIDES, Richards.

Voy. Ereb. and Terr. Fishes, p. 23, pl. 15, f. 1-2.—Gunth. Cat. Fishes II., p. 101.

D. 11. 1/12. A. 3/5. L. lat. 60-65.

The height of the body is three times and a-half in the total length, the length of the head three and a-fifth. Interorbital space concave, with two ridges, narrow, its width being one-ninth of the length of the head. The snout is shorter than the diameter of the eye, which is three times and one-third in the length of the head. Vertex with prominent spines. Tongue free anteriorly, the maxillary reaches behind the vertical from the centre of the eye. The third and fourth dorsal spines are the longest, twice and a-half in the length of the head and longer than the anal spines. Reddish, with five brown cross-bands; pharynx black.

Tasmania, Port Phillip, Port Jackson.

283. SEBASTES ALLPORTI, Casteln.

Proc. Zool. Soc., Victoria, Vol. I., p. 40.

Very much like *S. percoides*, and believed by Dr. Gunther to be identical. Form more elongate, the height being four times in the length, the head less than three times in the same; the lower jaw longer than the upper, the spines of the præoperculum very strong and sharp; the spines on the vertex very small, almost wanting; the scales of the body smaller than in *S. percoides;* the dorsal fin lower, the third spine longest; and the soft dorsal is more equal. Colour orange marbled with brown, and with brown bands; the dorsal fin is black, the soft portion bordered with white; a broad dark band across the tail; the ventrals and pectorals bright orange, the latter with a broad transverse band.

Hobson's Bay. Tasmania.

Genus SCORPÆNA, Art.

Head large, slightly compressed, *with a naked groove on the occiput*, armed with spines and sometimes with skinny flaps. Scales moderate or small; body generally with skinny appendages. Dorsal fin more or less deeply notched; ventrals thoracic; pectorals large, rounded, no appendages. Villiform teeth in the jaws and on the vomer, generally on the palatines also. Seven branchiostegals. Air-bladder none; pyloric appendages in moderate number.

All temperate and tropical seas.

284. SCORPÆNA CRUENTA, Richards.

Gunth. Cat. Fishes II., p. 112.

Scorpæna Militaris, Richards, Voy. Erebus and Terror, p. 22, pl. 14, f. 1-2.

The "*Red Rock Cod.*"

D. 11. 1/10. A. 3/5. L. lat. 45.

The height of the body about equals the length of the head, and is three and a-half times in the total. Head almost without scales. The length of the snout is one-fourth of that of the head, the width between the eyes one sixth; a shallow quadrangular groove on the occiput surrounded by very prominent spines;

orbital tentacles moderate. The third dorsal spine equals the second anal, and is more than half the length of the head. Of a beautiful scarlet colour, sometimes marbled with grey, belly whitish; sides with rounded dark blotches; fins reddish-pink, variegated with white; the spinous dorsal has a large black blotch covering the upper half of its posterior portion, the soft dorsal is thinly spotted, and transversely marked with white and red; the ventrals are pink; the pectorals marbled with pink, white, and brown.

Tasmania, Port Phillip, Port Jackson.

285. SCORPÆNA BYNÆNSIS, Richards.

Voy. Erebus and Terror, Fishes, p. 22, pl. 14, f. 3-4.—Gunth. Cat. Fishes, II., p. 113.

D. 11. 1/8-11. A. 3/5. L. lat. 45.

The height of the body is three times and a-half in the total length, the length of the head three and a-quarter. Head without scales except on the upper parts of the cheek and operculum. The length of the snout is one-fourth, and the space between the eyes one-sixth of the length of the head. The space between the eyes is deeply concave, but the ridges are inconspicuous and do not terminate in a spine posteriorly. The groove on the vertex shallow, quadrangular, broader than long, and surrounded by very prominent spines; orbital tentacles moderate. The fourth and fifth dorsal spines longest, half the length of the head, and shorter than the strong second anal spine. Body and fins variegated with brownish and white.

Port Darwin, Darnley Island, Port Jackson.

286. SCORPÆNA CARDINALIS, Richards.

Ann. and Mag. Nat. Hist. 1842, Vol. IX., p. 212.—Gunth. Cat. Fishes II., p. 116.

D. 11. 1/9. A. 3/5. L. lat. 55.

The height of the body is three times and two-thirds in t total length, the length of the head three and a fifth. Chee and upper part of operculum with rudimentary scales. The sp between the eyes exceedingly deep, with a central and two late ridges; its width is half the diameter of the eye, which is o fifth of the length of the head. A slight groove below the ey crown of the head with very strong, compressed, trenchant spin and with a groove which is divided into a central and two late portions. Orbital tentacles sometimes present. The spino dorsal as high as the soft; the third and fourth spines longe and twice and a-half in the length of the head; the eleve spine not half the length of the twelfth. The second anal spi strong with a longitudinal groove. Colour red, marbled a spotted with brown.

Port Jackson.

287. SCORPÆNA PANDA, Richards.

Ann. and Mag. Nat. Hist. 1842, IX., p. 216.—Voy. Erebus a Terror, pl. 41, f. 3-4.—Gunth. Cat. Fishes II., p. 117.

D. 12. 1/8. A. 3/5. L. lat. 67.

The anterior part of the spinous dorsal very high and the spi nearly free, the length of the third spine three-quarters that the head; pectoral fin reaches to the middle of the anal; t interocular space is very deep, the cavity on the crown a narr transverse furrow. Maxillary scaly. Head and back dott with black; caudal fin with two broad blackish cross-bands.

King George's Sound.

288. SCORPÆNA SUMPTUOSA, Casteln.

Researches on the Fishes of Australia, p. 17.

D. 10. 1/10. A. 3/5.

Palatine teeth strong, disposed in a transverse band, height body three and a-half times in the total length, the head less th three times in the same; the groove between the eyes deep with three longitudinal ridges, spines of the head strong and compressed; the third dorsal spine longest; the second anal spine the longest, shorter than the rays. Coloration red, with conspicuous black spots, the fins, excepting the ventrals, more densely spotted.

Western Australia, perhaps a variety of *S. cardinalis.*

289. SCORPÆNA BELLICOSA, Casteln.

Researches on the Fishes of Australia, p. 17.

D. 11. 1/10. A. 3/5.

Height of the body less than the length of the head, and three times and a-quarter in the total length; head moderately scaled; the length of the snout is three times and two-thirds in the length of the head, and is a little more than the diameter of the eye; orbital tentacles very small; space between the eyes very deep, with two very prominent longitudinal ridges. Spines on the vertex and all the opercular bones. The spinous dorsal is rounded above, highest in the middle and is formed of strong arched spines of which the first is the shortest, and the fourth, fifth, and sixth the longest. Light brown, covered with large irregular marbled spots; the lower parts of an orange-red. Fins spotted with dark brown, but no black blotch on the spinous dorsal.

Nicol Bay. Queensland.

290. SCORPÆNA DIABOLUS, Cuv. & Val.

Gunth. Cat. Fishes II., p. 117.

D. 11. 1/10. A. 3/5. L. lat. 44. Vert. 24.

Height of body three times and two-thirds in the total length, the length of the head twice and three-fourths. The upper portion of the operculum scaly. The length of the snout is one-third of that of the body; the width of the interorbital space is much more than the diameter of the eye, and four-times and three-quarters in the length of the head, the space is concave without ridges;

the vertex with a quadrangular groove, either square or br
than long, and with spines on each corner; a deep groove
the anterior angle of the orbit. No palatine teeth. The
and fourth dorsal spines longest, but shorter than the anal
Red, marbled with brown and bluish-white; pectoral fins
or banded with black anteriorly, caudal with brown cross-

Port Darwin.

Genus GLYPTAUCHEN, Gunth.

Head and body compressed; crown of the head with
saddle-like impression. Scales very small. Præorbital,
operculum and operculum armed. Dorsal fin continuou
spinous portion much more developed than the soft; an
three spines. No pectoral appendages. Villiform teeth
jaws, on the vomer and palatine bones. Seven branchio

Australia, one species.

291. GLYPTAUCHEN PANDURATUS, Richards.

Proc. Zool. Soc. 1850, pl. 1, f. 3-4.—Gunth. Cat. Fishes II.,

D. 17/7. A. 3/6. V. 1/5.

The cleft of the mouth reaches to the vertical from the
margin of the eye; the seventh dorsal spine is the longe
second anal is as long, but stouter than the third; the
is very large and reaches nearly to the origin of the anal

King George's Sound. Length five and a-half inches.

Genus PTEROIS, Cuv.

Head and body compressed, the former armed with s
its upper surface and on the sides, and provided with
flaps; no groove on the occiput. Scales moderate or sma
dorsal fin deeply notched, anal short; the spines and
some of the fins very elongate and generally free, but bra
no pectoral appendages. Villiform teeth in the jaws and

vomer, none on the palatine bones. Seven branchiostegals. Air bladder large; pyloric appendages in small number.

Indian and Australian Seas.

292. Pterois volitans, Linn.

Gunth. Cat. Fishes II., p. 122.—Bleek. Atl. Ichth. Scorp., pl. 2, f. 3.

D. 12. 1/11. A. 3-2/6-7. L. lat. 90. Cæc. pylor. 3. Vert. 10/14.

Nape of neck naked; the space between the eyes very concave, its width being equal to the diameter of the eye, which is once and three-quarters in the length of the snout. The pectoral fins reach to or beyond the caudal fin. Red: snout, head, and the whole body with a great many narrow blackish cross streaks, all the rays of the vertical fins spotted; the spots on the pectoral and vertical fins larger and between the rays.

Torres Straits, Endeavour River, Port Jackson.

293. Pterois zebra, Cuv. & Val.

Gunth. Cat. Fishes II., p. 126.—Bleek. Atl. Ichth. Scorp., pl. 1, f. 1.

D. 12. 1/10. A. 3/6. L. lat. 48-50. Cæc. pylor. 3.

Nape of neck scaly; the space between the eyes very concave, and much less than the diameter of the eye, which is once and a-quarter in the length of the snout. The upper and middle rays of the pectoral fin not, or slightly detached from one another, and not reaching to the caudal. The upper margin of the orbit with spines on the anterior and posterior angles only. Red: body with about six brown cross-bands, another across the opercles; cheeks spotted with brown. All the rays of the vertical fins black spotted; pectorals with semilunar blackish spots between the rays.

Port Jackson.

Genus Centropogon, Gunth.

Head and body compressed, with distinct scales. No groove on the occiput. Præorbital and præoperculum spiniferous. One

Australian and Indian Seas.

294. CENTROPOGON AUSTRALIS, White.

White, Voy. N.S. Wales, p. 266.—Gunth. Cat. Fishes

D. 15/9. A. 3/5.

Scales very small; the pectoral fin reaches to the or
anal: the third dorsal spine is the longest, once and a
length of the head; the second anal spine is longer than
the maxillary reaches to the vertical from the anterior
the eye. Brownish (in spirits), with five rather irreg
cross-bands, the first from the origin of the dorsal, the
the base of the caudal, the fifth across the tail.

Port Jackson.

295. CENTROPOGON ROBUSTUS, Gunth.

Gunth. Cat. Fishes II., p. 128.

D. 15/9. A. 3/5. L. lat. 85.,

Scales small; the pectoral fin does not reach to the
fourth and fifth dorsal spines are the longest, their le
less than half that of the head; the second and third
equal; the maxillary reaches to the vertical from the
the eye. Brownish, marbled and variegated with bla

Eastern Rivers of New South Wales.

side with four sharp recumbent spines, one sharp spine beside the nostrils, a ridge of five similar spines from the præorbital to above the angle of the præoperculum—one at the angle, two on the operculum, a spiny ridge above the operculum and one of two or three spines on each side of the occiput. The maxillary bone reaches to the vertical from the middle of the eye. The scales on the lateral line mostly end in filaments; the second anal spine very large. Colour yellowish, densely blotched and marbled with brown, a light coloured band behind the dorsal and anal fins, followed by a brown one of the same size; root of the tail light-coloured and faintly spotted.

Endeavour River.

297. CENTROPOGON MARMORATUS, Gunth.

Ann. and Mag. Nat. Hist. 1863, Vol. XI., p. 136.

D. 16/9. A. 3/6. L. lat. 68.

The third to sixth dorsal spines are the longest, half as long as the head; the second anal spine longer and stronger than the third. Yellowish, marbled with brown. Length three inches.

Moreton Bay.

298. CENTROPOGON SCORPÆNOIDES, Guich.

Neosebastes scorpænoides, Guich., Mem. Soc. Imp. des Sc. Nat. Cherbourg.

Centropogon australis, Casteln., Proc. Zoöl. Soc. Vict., I., p. 81.

The "*Gurnet*" of the Melbourne Market.

Height of body four times in the total length, the head three times and a-quarter; the diameter of the eye is three times and one-third in the length of the head; mouth extensible. Brown, with the lower parts of the head and body scarlet; dorsal green with red spots; caudal similar, with its posterior half black; anal variegated with red, brown and greenish-white; pectorals above obscure, variegated with red, beneath white and spotted; ventrals white.

Coasts of Victoria, Port Phillip. Seventeen inches long.

I doubt this being a *Centropogon*, and I have never seen the characters of M. Guichenot's genus *Neosebastes*.

Genus HOLOXENUS, Gunth.

Body compressed, covered like the fins with loose skin, which is either finely granular or provided with minute scales. The greater part of the spinous dorsal forms a separate fin, some of the posterior spines being contiguous to the soft fin. Three anal spines. Caudal rounded. Pectoral rays simple, not prolonged or thickened. Eye small. Mouth of moderate width with bands of villiform teeth. Gill opening very wide. Four gills with a cleft behind the fourth. Pseudobranchiæ.

This is a genus of doubtful position. Dr. Gunther placed it with some doubt among the *Cirrhitidæ* and Dr. Bleeker among the *Scorpænidæ*. The affinity to the latter seems to me to be the greater.

299. HOLOXENUS CUTANEUS, Gunth.

Ann. and Mag. Nat. Hist. 1876, Vol. XVII., p. 393.

D. 7. 3/10. A. 9. C. 12. P. 11. V. 1/5.

The height of the body equals the length of the head, and is two-fifths of the total (without caudal). Head strongly compressed, with the small eye on the anterior half, not far below the upper profile, which is concave. Snout of moderate length; mouth oblique with the lower jaw somewhat prominent. Vertical fins high, the anterior dorsal with a subsemicircular outline, with pungent spines, the first inserted above the eye, the third and fourth longest. Caudal peduncle narrow. The pectoral and ventral fins extend to the anal; the ventral attached in its entire length to the abdomen. Uniform whitish (in spirits). Two specimens, the larger ten inches long.

Tasmania.

Genus PENTAROGE, Gunth.

Head and body compressed, without any scales, præorbital and præoperculum with strong spines. One dorsal fin with twelve or thirteen spines, anal with three. No pectoral appendages. Villiform teeth in the jaws, on the vomer, and the palatine bones. Air-bladder small; pyloric appendages in moderate number. A cleft behind the fourth gill.

Australian Seas.

300. PENTAROGE MARMORATA, Cuv. & Val.

Gunth. Cat. Fishes II., p. 132.

"*Fortescue*" of the Sydney Fishermen.

B. 7. D. 12-13/10. A. 3/6. Cæc. pylor. 6. Vert. 11/17.

The præorbital spine very long, dagger-shaped. Cleft of the mouth slightly oblique, with the maxillary reaching to the vertical from the centre of the eye. The dorsal begins on the neck. Dirty yellowish, largely marbled with brown.

Port Jackson.

Genus TETRAROGE, Gunth.

Like *Pentaroge*, but having generally a greater number of spines in the dorsal fin, and not having a cleft behind the fourth gill.

Indian and Australian Seas.

301. TETRAROGE DARNLEYENSIS, All. & Macl.

Proc. Linn. Soc. N. S. Wales, Vol. I., p. 278, pl. 6, fig. 1.

Darnley Island, in coral.

Genus AGRIOPUS, Cuv. & Val.

Head and body compressed; the former without or with some small spines; præorbital spineless. Cleft of the mouth small; snout produced. Scales none. One dorsal with seventeen to twenty-one spines, beginning from the head; anal fin short; no pectoral appendages. Villiform teeth in the jaws, generally none on the vomer. Five branchiostegals. Air-bladder present; no pyloric appendages.

Cape Seas, Chilian Seas, South and West Australia.

302. AGRIOPUS LEUCO-PÆCILUS, Richards.

Voy. Ereb. and Terr. Fishes, p. 60, pl. 37, f. 4-5.—Gunth. Cat. Fishes II., p. 137.

D. 17/13. A. 10.

The fourth and fifth dorsal spines are the longest, and shorter than the head. No spine before the orbit. Skin smooth. Largely marbled with black; some irregular whitish blotches along the lateral line.

South Australian Seas. King George's Sound.

Genus APLOACTIS, Temm.

Head and body compressed, covered with small prickles filaments. Obtuse protuberances on the head. Some (from th to five) of the anterior dorsal spines forming an almost disti division. No pectoral appendages. Teeth in the jaws, on vomer and sometimes on the palatine bones. Five branchiosteg

Seas of Japan, China, and Australia.

303. APLOACTIS MILESII, Richards.

Ann. and Mag. Nat. Hist. 1851, Vol. VIII., p. 275.—Gunth. Cat. Fishes II., p. 142.

D. 13-14/14. A. 12. C. 13. P. 11. V. 1/2.

Head with obtuse knobs, and blunt ridges, the dorsal fin begins over the orbit, the second spine the longest and nearly the length of the head, the fifth shortest. Dark brown, indistinctly marbled and mottled with purple and white, with a few pinkish marks some bands of small white spots on the tail.

King George's Sound, Port Jackson.

304. APLOACTIS SCHOMBURGHII, Casteln.

Aploactisoma Schomburghii, Castelnau, Proc. Zool. Soc. Vict., II., p, 64.

Count Castelnau formed the genus *Aploactisoma* for this species on account of its having teeth on the palatine bones, but it is scarcely worth preserving. The species differs from *A. Milesii* chiefly in the form of the dorsal fin, which is thus described by Castelnau: "The first dorsal is as high as the distance from the snout to the centre of the eye; it has five spines, the three first much longer and thicker than the others and placed near one another, the second longest; the fourth is much shorter and more remote, the fifth the smallest: there are thirteen spines and fifteen rays in all. Coloration much as in *Milesii*, with a black spot at the posterior angle of the soft dorsal, and a black border to the caudal and anal fins.

South Australia."

A Fish has been described by Bleeker under the name of *Paraploactes trachyderma* which perhaps ought to come in here as it is said to be Australian, but I have no knowledge of it or its description.

Genus SYNANCIDIUM, Müll.

Head irregularly formed, large; scales none; body and sometimes head and fins with skinny flaps. Dorsal fin with thirteen spines; anal with five rays. Villiform teeth in the jaws and on the vomer, none on the palatine bones. Seven branchiostegals; air-bladder present, small pyloric appendages in small number.

Indian and Australian Seas.

305. Synancidium horridum, Linn.

Gunth. Cat. Fishes II., p. 144.

D. 2. 11/6. A. 3/5. Cæc. pylor. 3. Vert. 10/14.

A very large and deep hemispheric groove on the cheek; crown of the head saddle shaped. Vomerine teeth. Dark brown, the fins with lighter bands.

Port Essington, Port Jackson.

Family IX. TEUTHIDIDÆ.

Perciform Fishes with an outer and inner spine in the ventral fin.

Genus Teuthis, Linn.

Teeth small, denticulated, in a single series. Fins, dorsal 13/10; anal 7/9; V. 1/3/1. Scales minute. Five branchiostegals. Pseudobranchiæ well developed; air-bladder large, forked anteriorly and posteriorly. Intestinal tract with several circumvolutions; five or six pyloric appendages.

Herbivorous Fishes. Indian and Pacific Oceans.

306. Teuthis javus, Linn.

Gunth. Cat. Fishes III., p. 315.

The height of the body is two-fifths of the total length; the length of the free portion of the tail is contained twice and three fifths in that of the head. Ground colour dark, the whitish spots are round on the back, oblong on the side, and confluent and forming longitudinal streaks on the belly, the spots and streaks are narrower than the interspaces of the ground colour. Head without streaks; vertical fins immaculate.

Hobson's Bay, Port Jackson.

307. TEUTHIS VERMICULATA, Cuv. & Val.

Gunth. Cat. Fishes III., p. 317.

The height of the body is contained twice and two-fifths in the total length. Brown, with vermiculated bluish lines on the head and the whole body, except the belly; caudal fin dotted all over with brown.

Trinity Bay (Chevert Exp.)

308. TEUTHIS TUMIFRONS, Cuv. & Val.

Gunth. Cat. Fishes III., p. 317.

The height of the body is contained thrice and a-half in the total length. Caudal fin emarginate. Snout rather broad, convex. Brown, dotted all over with whitish, the dots very small and extending on the dorsal and anal fins.

Sharks' Bay, West Australia.

309. TEUTHIS ALBOPUNCTATA, Schleg.

Gunth. Cat. Fishes, III., p. 318.

The height of the body is contained three times and a-half in the total length. Caudal fin emarginate. Ground colour brownish-olive, with scattered, small, roundish, whitish spots on the back and sides, which are smaller than the interspaces between. A dark brown blotch on the shoulder, less distinct in large specimens.

Cape Grenville (Chevert Exp.)

310. TEUTHIS NOTOSTICTA, Richards.

Ann. and Mag. Nat. Hist. 1853, XI., p. 172.—Gunther, Cat. Fishes III., p. 320.

The height of the body is rather more than one-third of the total length. Caudal fin subtruncate. Light brownish-olive (in a dried state), body with brown spots, which are smaller than the interspaces, and confluent on the back into short narrow vermiculated streaks.

Port Essington, Darnley Island (Chevert Exp.)

311. TEUTHIS NEBULOSA, Quoy & Gaim.

Gunth. Cat. Fishes III., p. 321.

The "*Black Trevally*" of the Sydney Fishermen.

The height of the body is one-third of the total length. Caudal fin deeply emarginate. Dorsal spines slender, the length of the fourth is less than the distance of the snout from the posterior margin of the orbit. Brown, irregularly marbled with darker.

Sydney, Port Essington, North and East Coasts.

312. TEUTHIS DOLIATA, Cuv. & Val.

Gunth. Cat. Fishes III., p. 323.

The height of the body is contained twice and two-thirds in the total length. Orange-coloured, with about thirty vertical bluish lines, the last of which are bent and run longitudinally along the hinder part of the tail; those above the pectoral fin are oblique and those on the operculum reticulated.

Fair Cape (Chevert Exp.)

NOTES ON SHELLS FROM THE SOLOMON ISLANDS AND AUSTRALIA.

BY J. BRAZIER, C.M.Z.S., &c.

1. CYPRÆA SOPHIÆ.

Cypræa sophiæ, Braz., Proc. Linn. Soc., 1875, Vol. I., p. 7.

Hab. Makeira Harbour, San Christoval, Solomon Islands.

I distributed a few specimens of this species among English and Australian Conchologists under the name of *Cypræa chrysostoma* in 1873, not wishing to retain that name. I gave the above in preference. I find that I have named it in the Hargrave's Collection in the Australian Museum as *C. chrysostoma*.

2. HELIX ROCKHAMPTONENSIS.

Helix Rockhamptonensis, Cox, Proc. Zool. Soc., 1873, p. 150.
„ *planibasis*, Cox, M.S., 1871.
„ *Moresbyi*, Angas, Proc. Zool. Soc., 1876, p. 267, pl. xx., figs. 8, 9.

Hab. Rockhampton, North-east Australia (Anderson).

This species was distributed in 1871 by Dr. Cox, named as *Helix planibasis*, a name I find in use in all the Australian Collections. I received my specimen from the person who first found it. Only recently Mr. Angas describes it under another name from specimens a little larger, said to come from Port Denison; I doubt this locality. For the convenience of Conchologists in Australia I subjoin the descriptions of Dr. J. C. Cox's species and that of Mr. G. F. Angas :—

Helix Rockhamptonensis, Cox.—"Shell with a large, open umbilicus, globosely conical, finely striated, dark purple chestnut, indistinctly ornamented at the base and apex with narrow yellow bands, the latter lightest; base flat, excavated round the umbilicus; spire large, bluntly conical, suture not margined; whorls six, convex, last produced; aperture diagonal, ovately lunate, dark purple within; peristome broadly expanded and reflected throughout; margins joined by a thin callus, columellar margin triangularly dilated, overhanging the umbilicus. Diam., greatest 1·27, least 1·08; height 1·12 of an inch."

"This is an interesting link between *H. Bloomfieldi* (which it in general aspects most resembles), *H. Parsoni* and *H. Rainbirdi*, having the flat base and large umbilicus of the last, and the large globosely conical form of the first, but with an absence of the characteristic margin of it and of *H. Parsoni*." (Cox.)

Helix Moresbyi, Angas.—"Shell umbilicated, globosely conical, moderately solid, finely and irregularly obliquely striated, fulvous chestnut, paler at the apex, with various broad and narrow bands of deep brown, darker below the sutures; spire conical; whorls six, convex, the last somewhat flattened at the base and excavated towards the umbilicus; aperture oblique, sublunate, within glossy and of a pale purplish hue, lips black, margins approximating and joined by a thin callus, outer margin expanded and subreflexed, columellar margin dilated, partly concealing the umbilicus. Diam. maj. 23, min. 14, alt. 23 lines."

"In its general character this species comes nearer to *H. Yulei*, Forbes than to any other; but it differs in being larger, very much more conical, and in having the base of the last whorl peculiarly flattened." (Angas).

3. Helix gelata.

Helix gelata, Cox, Proc. Zool. Soc., 1873, p. 149. pl. xvi., f. 5*a*. 5*b*.

Profusely ornamented and zoned with opaque white, apex almost black, interior of aperture dark chestnut; lip white.

Variety Helix Maddocksi, Brazier.

Shell light straw yellow, ornamented on the periphery with two dark chestnut bands, the lower being contiguous to the suture, the upper continued a little above the suture, apex reddish; interior of the aperture white showing the dark chestnut bands; peristome white; margins (in some specimens approaching and in others distant) joined with thin white callus, right margin thin, rather broadly expanded and reflected; outer margin somewhat rounded and deflected; columellar margin broadly reflected covering about one half of the deep umbilicus. Diam. maj. 12, min. 9½, alt. 7 lines

Hab. Small Island near Timbo or Eddystone Island, Solomon Islands (Brazier).

Var. *a.*—Light yellow, ornamented with one broad chestnut band on the periphery and continuous at the suture.

Var. *b.*—Darker yellow, ornamented on the base with two fine lines on the periphery, two wider and a fine one below the suture.

Var. *c.*—Nearly white, base with one broad band nearly black, periphery and upper part ornamented with three broad bands.

Var. *d.*—Light brown, base ornamented with one narrow chestnut line, periphery with two rather broad, white lines at the suture; below a light brown intermingled with a few dark brown opaque spots.

Var. *e.*—Bright straw yellow, two narrow reddish bands on the periphery, apex light red.

Var. *f.*—Light yellow, nearly white, the periphery ornamented with one narrow reddish line, obsolete on the upper whorls.

Var. *g.*—Light yellow, with opaque white band on the periphery with a fine reddish line above and below it.

Var. *h.*—Dark yellow, ornamented with numerous opaque lines of a light yellow on the periphery and base, upper whorls white, apex dark red.

Var. *i.*—Light straw yellow, upper whorls white, apex dark red.

It is a very remarkable fact that *Helix Eddystonensis*, Reeve, is found on Eddystone Island, and only a short distance from it on another small island not named on any chart we get *Helix gelata*, Cox, and *Helix Maddocksi*, Brazier; the varieties I enumerate are procured in countless numbers, whereas *H. gelata* is very rare.

SPECIES OF EUCALYPTUS IN THE COUNTY OF CUMBERLAND: THEIR HABITAT AND USES.

By the Rev. Dr. Woolls, D.D., F.L.S., &c.

Part II.

Section I. Leiophloiæ.

1. *E. radiata*, (Sieb.) so called from the rayed appearance of the flower-buds, is a tree of moderate size, growing on the banks of the Nepean River and some of the adjacent creeks, and ofte seen with long strips of bark hanging from the upper branches It is usually called "River White Gum," because the butt an branches are white and smooth, when they have shed their bark In the *Flora Australiensis*, (Vol. III., p. 203), it is described as variety of *E. amygdalina*, (Labill.), or the "Messmate" of th Southern Ranges, and Baron F. von Mueller, in his *Eucalypt graphia* (Decade 5.) appears to adopt the same view for th purposes of classification. Although the flowers, fruit, and leav of the trees are very similar, yet they differ most materially i bark, habit, size, and wood. *E. amygdalina*, as it is seen on th Mittagong Range, belongs to the section *Hemiphloiæ*, attains gigantic size, and affords useful timber; whereas *E. radia* occurs only near rivers, has a smooth bark, never rises very hig and is not esteemed for its wood. No one who has examined t trees in their native soil, would suppose that they could b reduced to the same species; and although the anthers of bot are similar in shape, yet the fruit and the leaves are by no mea identical. In the supposed varieties of *E. amygdalina*, howeve the leaves abound in volatile oil, and are opposite and alternat and thus, as there are certain points of resemblance among them, it is not surprising that a mere inspection of dried specimen independent of any reference to habit, should lead to the conclusi that *E. radiata* is only a form of *E. amygdalina.*

2. *E. saligna*, "the Blue or Flooded Gum" of N. S. Wales, one of the finest of our Eucalypts, rising to 100 or 120 feet wit

a diameter of seven feet. The specific name is rather unfortunate as the leaves for the most part are ovate-lanceolate, and, with the exception of the fact that the tree is generally found growing on the banks of rivers or creeks, it bears no resemblance to the willows. Although rapid of growth and of less specific gravity than man of the Gums, the wood is used for building purposes, such as scantling, battens, flooring boards, posts and rails, and ships' planks, and it is excellent for the naves and felloes of wheels. In the *Flora Australiensis* (Vol. III., p. 229), the Blue Gum, or, at all events, some forms of it are referred to *E. botryoides* a tree very different in habit and belonging to another section. *E. saligna* occurs on many creeks in the county of Cumberland, and extends westward to the banks of the Grose and the gullies of the Blue Mountains. The wood of the mountain variety is used extensively by wheelwrights and carpenters, but it is reported to be somewhat inferior to that of the low country. According to Baron Mueller's figure (Decade 2.), the anthers are oval, opening with longitudinal almost parellel slits, and the seeds are without any expanding membrane. The bark of this tree is remarkably smooth, of a bluish-white, or mottled appearance; whilst, in exceptional cases, a rough fibrous bark is found on the butt. Though occurring generally near rivers or creeks, it is sometimes seen as a forest tree, and as such indicates a good soil. On the other side of the Dividing Range, *E. rostrata* is the species common on rivers and creeks.

3. *E. hæmastoma,* (Smith), or the "White Gum," takes its specific name from the reddish rim of the fruit, but as this peculiarity is not limited to one species of the genus, the designation is not a very appropriate one. This tree has a smooth white bark, and although similar to *E. Sieberiana,* (F.v.M.) in the shape of the anthers, yet it differs from that species in the texture of the bark, the venation of the leaves, and the shape of the fruit. At first sight, dried specimens of both species appear very similar; but upon careful examination, it will be found, as Baron Mueller

justly remarks, that in *E. hæmastoma*, the veins are more spreading and prominent, the sterile stamens more numerous, and the fruit more inclined to be hemispherical. Both trees grow in the same soil, and they occur here and there on dry sandy ground from the neighbourhood of Sydney to the Blue Mountains, and seldom attain any great height; but they do not flower precisely at the same time. *E. micrantha* (DC.) seems to belong to the same species, but the flower buds and fruit are much smaller. The wood of the White Gum is not esteemed, being, according to the views of Sir W. Macarthur and Baron Mueller, generally crooked in growth and apt to decay, though in some places it is used for rough carpentry. As a wood for fuel, it is of very little value. In the neighbourhood of Parramatta and also on the Blue Mountains, this species appears sometimes with thin fibrous bark on the butt, and with fruit larger, and hemispherical in shape. This deviation from the typical form may, perhaps, be due to a greater moisture in the soil.

4. *E. viminalis*, sometimes called "Grey or Flooded Gum," and sometimes "Drooping or Manna Gum," is a species, which with some variations extends to many parts of N. S. Wales. Though on the Western side of the Dividing Range, and on the Southern Coasts of Australia, it rises to 150 feet in alluvial soil, yet, in the county of Cumberland, it is for the most part a tree of moderate size with a smooth, greyish bark and drooping habit. It resembles some forms of the common Grey Gum *(E. tereticornis)* but it differs from that species in the size of the operculum, the venation of the leaves, and the shape of the fruit. This is one of the Eucalypts in which the operculum varies, being sometimes hemispherical and sometimes conical, but seldom much longer than the calyx tube. Whilst it may be admitted that the forms of this tree, as found in many parts of the county of Cumberland, are not specifically distinct from the Manna Gum of the interior, yet the trees vary considerably in height, the colour of the bark, and the value of the timber, whilst the so-called Manna is more

common on the Western variety. Baron Mueller mentions in the fifth Decade of his *Eucalyptographia*, "that the Revd. Canon King noticed melitose-manna to a small extent on the leaves of *E. corymbosa*, when pierced by a phyllophagous beetle *(Anoplognathus cereus)*." The same substance has also been found on *E. punctata* near Parramatta. Mr. Bentham proposed to unite the Camden Woolly Butt with *E. viminalis*, but the former differs in having fibrous bark on the butt, and leaves occasionally opposite, especially on the young branches.

5. ***E. tereticornis***, (Sm.), which, in different parts, has the names of "Grey," "Blue," or "Red Gum," and sometimes "Bastard Box," is one of the common forest trees on this side of the Dividing Range. It is also subject to great variation in the foliage, the size of the flowers and fruit, and the quality of the wood. The typical number of the florets is seven in each umbel and the operculum is generally much longer than the calyx; but in damp situations, the florets are frequently more pointed. This may be regarded as the most variable species near Sydney. Mr. Bentham reckons three varieties, viz. *latifolia*, *brachycorys*, and *brevifolia*, founded principally on the shape of the leaves and the opercula; but as these organs are liable to great differences arising probably from local causes, the varieties might be much extended. There is, however, very little difficulty in identifying the species, for whilst it is distinguished from some of its congeners by the shape of its anthers, it is separated from other allied species by the configuration of the fruit. In a dry state, it is difficult to distinguish the flower-buds from those of the large-leaved Iron Bark and the Red Mahogany, but as the bark of the three species is quite different, no one who has an opportunity of examining the trees in a living state could mistake the one for the other. This tree, which sometimes rises to 100 feet and upwards, affords useful timber for rails and posts, firewood, and rough buildings.

6. *E. punctata*, (DC.) is regarded by Mr. Bentham as a varie of *E. tereticornis*, but whilst the former is separated from it the leathery texture of the bark and the toughness of the wo the venation of the leaves and the shape of the fruit also sh that the species are distinct. In size and habit, the two tr are somewhat alike, whilst, according to Mr. Bentham's artific system, *E. punctata* is closely allied to *E. resinifera*, or the R Mahogany, a tree of another section under the cortical syste Baron Mueller (Decade 1.) notices that my Parramatta specime agree precisely with Heyland's drawing in De Candolle's *Mémo sur la famille des Myrtacées*, pl. 4, and he agrees with me in thinki that it should be restored to the dignity of a species. Amon woodmen, this tree is called Hickory or Leather Jacket. T wood is exceedingly tough and durable, and, next to Iron Ba it is one of the most useful kinds for railway sleepers and w underground. In a technical point of view, *E. punctata* distinguished from *E. tereticornis* by the fruit and leaves, t valves of the former being less prominent and the rim narrow whilst the venation of the latter is much more parallel, a approaching that of *E. saligna*. This tree does not genera indicate good soil, but when occurring in low swampy pla near the coast, the flowers and seed vessels are much lar than those of the ordinary type. The leaves abound in volat oil, and the wood, which serves the same purpose as that of t last species, is also valuable for firewood. There is someti some dark, rough, persistent bark on the butt of this tree, bu is never, strickly speaking, hemiphloious.

7. *E. maculata*, (Hook.), or "The Spotted Gum," is a fine t rising to 100 feet and upwards, and sometimes 80 or 90 f without a branch. It grows on poor soil, or on the rocky si of hills, and as a species is well defined by its double operculu somewhat urn-shaped fruit, and large fertile seeds, which black and shining. Baron Mueller has given a splendid fig of *E. maculata* in his *Eucalyptographia*, in which the peculiarit

of the species are well represented. In the early days of the colony, the wood was not much valued, as it had the character of decaying very soon when placed in the ground. Of late years, however, a different opinion has been expressed, and it is now used extensively for the staves of casks, the upper parts of railway bridges, and ship-building. The Baron states that "General Ward, K.C.M.G., found the specific gravity of the wood to be at an average in four experiments 0.942, and he records also the strength of this timber to bear a transverse strain and its degree of elasticity, in which respects it ranks high in value, though not equalling the best Iron Bark trees." *E. maculata*, occurs in the neighbourhood of Liverpool, and on the hills near Cobbitty, and has an extensive range in other parts of the colony. According to the systematic arrangement of Mr. Bentham, this species ranks next to *E. eximia*, or the smooth barked Bloodwood, but the trees are very different in habit and appearance, the one having smooth or mottled bark, whilst the other has a roughish bark of a fibrous texture, though not so well defined in that respect as *E. corymbosa*, the common Bloodwood.

8. *E. obtusiflora*, (DC.) is the only shrubby species indigenous in the county of Cumberland. It is found not far from the sea-coast near Sydney, and then again on the Blue Mountains about 2,000 feet above the level of the sea. In the coast variety, the leaves are sometimes four or five inches long, and three-quarters of an inch wide, the operculum obtuse, the flowers large for so small a species, the fruit ovoid-truncate, and above half an inch in length. On the Mountains the leaves are nearly as long, but not half an inch in width; whilst the flower-buds are somewhat mucronate, and the fruit about four lines in length. Judging from the bark, the shape of the anthers and the shrubby habit, it appears to me that both forms must be referred to the same species. There is, however, some difficulty respecting the shrubby Eucalypts which form brushes on the highest parts of the Mountains. Two of them are regarded by Mr. Bentham as

varieties of *E. stellulata* (Sieb.), viz. var. *angustifolia* with narrow thick leaves scarcely showing the venation, and *var. microphylla* which does not show any venation. This last variety is sometimes mistaken for *E. stricta*, another shrubby species with fibrous bark Mr. Bentham, who had the opportunity of examining the specimens of Sieber, A. Cunningham, and the writer, distinguishes *E. stricta* from the others by its anthers. Those referred to *E. stellulata* and *E. obtusiflora* have reniform anthers, the cells divergent, and confluent at the apex, whilst the last has anthers with distinct parallel cells, opening at first in round pores which extend into oblong slits. In the sixth Decade of his *Eucalyptographia*, Baron Mueller expresses a somewhat different opinion.

Section II. Hemiphloiæ.

1. *E. Sieberiana* (F.v.M.), is the same as *E. virgata* (Sieber), the name having been changed by Baron Mueller, as it is only under exceptional circumstances, that the tree is reduced to a virgate or twiggy state. This species passes for one of the "Blackbutts" near Sydney, but on the Mountains and near Berrima, it is called "Mountain Ash." The butt of the tree is covered with a dark-coloured, deeply furrowed bark, similar to that of Iron Bark, but not so hard and resinous, whilst the branches are similar to those of the White Gum *(E. hæmastoma)*. As already noticed, there is a great similarity between *E. Sieberiana* and *E. hæmastoma*, and to an ordinary observer, they seem to differ only in bark and wood. An examination of Baron Mueller's excellent figures will show how nearly they approach each other. In the stunted form, in which *E. Sieberiana* appears near the coast, the wood is not valued, but, according to Sir W. Macarthur, "it is much valued for rough purposes in districts where the better sorts of timber are not produced." He adds "this species usually occupies rough, rocky sites, and seems to form a link between the division of Iron Barks and that of Gums." This tree in the Southern Districts rises sometimes to 120 feet,

and the wood is said to make better staves for casks than that of Spotted Gum. It may also be employed for shafts, rough work, and fencing. The specific name was given in honour of its discoverer, Franz Wilhelm Sieber of Prague, who, in 1823, collected many specimens of native plants in New South Wales.

2. *E. pilularis* (Smith), the "Blackbutt" of the colonists, is a large tree, extending from Victoria to Queensland, rising, in good soil, to 100 or 150 feet in height, and sometimes even higher. It derives its specific name from the supposed pilular form of the fruit, and its popular name from the dark fibrous bark of the butt. This species, though rapid in growth, is one of the most valuable in the county of Cumberland, the wood being much in use for building, flooring-boards, and railway sleepers, and next to the White Iron Bark, *(E. siderophloia)*, capable of enduring a greater crushing strain than any other Eucalypt. The White Mahogany *(E. acmenoides)* was regarded by Mr. Bentham as a variety of *E. pilularis*, but this cannot be the case, as the former has fibrous bark, (resembling that of Stringy Bark), wood different in grain and colour; and the young seedlings have alternate leaves; whilst, as Baron Mueller remarks, "It ranges over a wider geographic area than the typical *E. pilularis*, extending far into the tropical regions of Eastern Australia." There can be no doubt but that the two trees are quite distinct, and, though the reniform shape of the anthers and similarity of fruit have caused them to be associated together, they must be placed in separate sections. In favourable situations, the seedlings of the Blackbutt are very numerous, all with narrow, sessile, opposite leaves, pale underneath, and full of pellucid dots, though the full grown leaves generally are not so abundant in volatile oil as those of some other species. The specific gravity of the wood is about 0·897.

3. *E. hemiphloia* (F.v.M.), or "Box" (so called from some fancied resemblance to the wood of the European Box) is one of our commonest forest trees, and indicates good grazing country.

The wood is somewhat variable, but generally speaking it is useful on account of its toughness and durability, though it is subject to white ant and dry rot when standing long in the ground. It is excellent for firewood, and the bark is utilised for covering rustic buildings. This tree also varies considerably in size; for whilst, in some places, it rises over 100 feet, it appears in other somewhat stunted in growth. The specific name is rathe inappropriate, as there are several species of half-barked Eucalypt to which the name is equally applicable. With the Box of th Eastern coast, Baron Mueller connects *E. albens*, or the "Whit Box Tree" on the other side of the Dividing Range, as the tree agree in all their characteristics, differing only "in the mo extensively persistent bark, in paler dull foliage, and in chalk white bloom on the flowers." Mr. Bentham places the trees i different sections, but, according to his description of the anther they vary only in the openings, and that, too, not materially, t difference probably arising from the comparative age of t flowers. This tree is quite distinct from the Yellow Box of t interior, (*E. melliodora*), which is a tree of moderate size with smooth bark of a pale colour, scaling off in flakes, especially i the upper parts. It also differs from the Dwarf Box of t Darling in having the fruit more oblong in shape, and the capsu more deeply sunk.

4. *E. longifolia*, (Link & Otto), the common "Woolly Butt, is well defined by its large flowers and fruit, and long leave The flowers are generally in threes, and the leaves sometimes foot in length, whilst the fruit is larger than that of any Eucaly near Sydney, excepting perhaps an occasional specimen of *resinifera*, growing near the coast. The bark of the Woolly Bu is somewhat variable, for, whilst in the younger trees, it is of brown colour, thick, deciduous, and scarcely fibrous, that of t older trees becomes persistent on the butt and of a greyish colou the branches being smooth and pale. In favourable situation the Woolly Butt sometimes attains the height of 150 feet with

diameter of five feet. The wood though more easily worked than that of many Eucalypts, is not considered durable, and is more valued for fuel than any other purpose. According to experiments directed by Baron Mueller, the bark of this tree yields 8·3 per cent. of Kino-tannic acid and can be converted into packing paper; whilst it was found, from leaves which were forwarded from Parramatta, that the yield of 100 lbs. of them is between three and four ounces of volatile oil, remarkable for imparting an indelible transparent stain to paper, and giving a clear flame somewhat inferior to kerosene in intensity. The specific gravity of this oil is 0·940, and the boiling points between 380° and 420° respectively. *E. longifolia*, as the Baron remarks, is not easily mistaken for any of its congeners. It seems to attain its greatest size in New South Wales, but it does not extend far inland.

5. *E. largiflorens* (F.v.M.), seems to be the *E. bicolor* of A. Cunningham, and is known to workmen as "Bastard Box," "Yellow Box," and "Gumtop." It is a very large tree growing in low or swampy places to the height of 150 feet. In its young state, it resembles the common Box, but, as the tree advances in age, it loses its half-barked character and resembles the Grey Gum, though frequently retaining some fibrous bark on the butt. The specific name *largiflorens* is very appropriate, for, although the tree does not appear to flower regularly, the top of it is sometimes one mass of flowers. In the larger trees, the wood is very tough and durable, being adapted for fencing, shafts, cogs, and rough buildings, but they are frequently hollow and decayed at heart. The flowers and leaves of this species resemble some forms of *E. crebra*, but, whilst the two species belong to different sections under the cortical system, they are also separated by the venation of the leaves and the shape of the anthers. It would appear that *E. largiflorens* has a very wide range, and it is remarkable for extending far into the interior, though somewhat dwarfed in growth, and occasionally with red filaments. For the determination of this species we are much indebted to Baron

Mueller, for he has not only corrected the errors of the *Flora Australiensis*, Vol. III., p. 215, (in which specimens of *E. crebra* and *E. populifolia* seem to have been associated with *E. bicolor*), but he has also removed all doubt as to its identity by the accurate figure which he has furnished of its flower and fruit *(Eucalypt.* Decade 5.)

NOTES AND EXHIBITS.

Notes on a new variety of *Helix Palmensis*, by J. Brazier, C.M.Z.S., &c.—*Helix Palmensis*, variety *meridionalis*. Shell very thin, transparent, brownish yellow; suture with a dark reddish brown band about half a line broad on the two lower whorls; four upper having it continued in a fine thread spirally to the apex; periphery with seven or eight faint nearly obsolete chestnut lines contiguous to the suture; umbilicus encircled with dark chestnut; peristome thin, slightly reflected, internal edge dark nearly black. Diam. maj. 20, min. 15, alt. 14 lines. *Hab.* Large South Palm Island, North-east Australia (C. E. Beddome). This very fine thin specimen was obtained by Mr. Beddome during a short stay at the abovenamed Island in 1877, he also obtained the typical form but larger than those I obtained on the Great North Palm Island during the Chevert Expedition and described in these Proceedings 1876, p. 105. Mr. Beddome also found one specimen of *Helix Mulgravensis*, Braz., when described in the Proc. Zool. Soc., 1872, p. 21, I gave as the habitat Mulgrave Island, Torres Straits on the authority of a trader. The islands in the Straits do not produce any of the banded *Helicidæ*, the only large species of *Helix* on the islands in the Straits is *H. semicastanea*, Pf., it is reddish-yellow above, base deep chestnut.

Mr. Brazier exhibited an unusually large Tick *(Ricinus)*, taken on an *Echidna Hystrix;* also the shells referred to in his papers, and some *Phyllotheca* fossils from Rookwood.

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WEDNESDAY, SEPTEMBER 29TH, 1880.

The Vice-President, W. J. Stephens, Esq., M.A., in the Chair.

MEMBER ELECTED.

Dr. Gordon of Murrurundi.

DONATIONS.

Eight Annual Report of the Zoological Society of Philadelphia.

Verhandlungen Zool-Botanischen Gesellschaft in Wein, 1879.

Journal of the Royal Microscopical Society, London, Vol. III., No. 1 and 4.

Bulletin of the Museum of Comparative Zoology, Harvard College, Massacchusetts, Vol VI., No. 3.

Journal of Conchology, Vol. III., No. 3.

PAPERS READ.

ON A NEW SPECIES OF DIASERIS.

BY THE REV. J. E. TENISON-WOODS, F.G.S., F.L.S., PRES. LINN. SOC. N.S.W.

Amongst some corals recently dredged at Port Denison by Messrs. Haswell and Morton there is one new species of a very interesting character. It belongs to the section *Madreporaria aporosa*, family *Fongidæ*, second sub-family *Lophoserinæ*. Amongst the simple and free corals of this division there is one with bare and lobed walls which Messrs. M.-Edwards and Haime experienced much difficulty in assigning to any position because of the incomplete character of the calice. A new genus was erected for it, placed as above, removing it from the genus *Fungia* in which it had been included by Michelin (Magasin de Zoologie, Vol. V., 1843).

The genus is thus described:—" *Diaseris.* Corallum simple, free, discoid, with a bare and costulate wall with a structure similar to *Cycloseris*, but in its young state it is formed of a certain number of separate petaliform lobes which in the more mature state become more or less united by their edges." The authors add that in all the various families of corals no other instance of this structure is known. Two species were described by them, *Diaseris distorta*, Michelin, of unknown habitat and *D. Freycineti.* Both were large, viz., 50 millimetres across and 10 high, and the differences between the species were that *D. Freycineti* was a coral with closer septa which were not so high as *D. distorta.* See Hist. Nat. des Corallaires, Vol. III., p. 54. Also Comptes Rendus de l'Academie des Sc., Vol. XXIX., 1849, p. 72.

The species to which I have now to call attention is very much smaller than either of the preceding and there are also peculiarities in the septa as I shall proceed to show.

DIASERIS MORTONI, *n. s.*, Plate XV., fig. 1, 2.

Corallum semicircular, thin, subdiscoid, divided into two, three or four lobes in some specimens, though the majority are completely semicircular with an entire rounded edge. Base flat or concave in the slightest degree, showing no trace of any former separation between the lobes. Costa distinct, fine, granular and corresponding with the septa, but all equal in thickness and taking their origin from the edge at distances the same at the various orders; the outer edge of the septa projecting like the teeth of a fine cog-wheel outside the base. In nearly all the specimens these were four distinct systems, though some had only three, two, and some with only one and the rudiments of two others. The cycles depended on the age of the specimens. They ranged from five to eight incomplete. All are granular, but the granules are in ridges so as to give rise to a vermicular surface and the ridges project at exactly opposite sides of the septa; the synapticulæ are few and quite at the base. The primaries are quite free with a conspicuous thickening at their origin; the secondaries are also free with a slight thickening, and both have a rounded crenulate margin. All the other orders gradually branch out or divaricate from one another with a gradual curve. They are very incompletely formed so as to be deeply divided into irregular paliform lobes. The height to which the septa rise is also dependant on their age, the first being much higher than the rest and sloping gradually from the margin upwards towards the central fossa and so on proportionately for all the cycles. All except the central septum curve towards the outer margin so as to preserve a flabellate form. In the fossa there are a few papillæ of a columella.

There can be no doubt that this form of coral is a form of *Cycloseris*, in which some of the systems are aborted. In this view there is nothing to distinguish the present species from *C. cyclolites*, except the size. I do not say that this is the true nature of the organism, but a close attention to the young stages will reveal the whole matter. It will be observed that one strong point in favour of the explanation which is suggested for this abnormal coral is the variation in the number of systems which are aborted. In many instances all are gone but one. In this case however, we have a semicircular fringe of septa round the fossa which represents all the other systems. Another fact is the occurrence of one or two specimens in which only one system is aborted. In this case the coral is to all intents and purposes a very small and depressed *C. cyclolites* minus one system.

About sixty specimens were dredged up off Holborn Island. They are of various sizes and seem to indicate some disadvantageous circumstances in their growth by which they have been stunted. Some of the specimens were much eroded and full of small grains of sand, foraminifera, &c. I have dedicated the species provisionally to Mr. Alexander Morton.

DESCRIPTION OF TWO NEW SPECIES OF AUSTRALIAN FISHES.

By E. P. RAMSAY, F.L.S., &c.

SOLEA MACLEAYANA, *sp. nov.*

D. 64-66. A. 50. C. 18. V. 5.

The height of the body is twice and one-seventh in the total length without the caudal fin; the length of the head is one-sixth of the total length, and about five times and one-fourth in the total without the caudal; no pectoral fins; the right ventral joined to the anal; a small tubular nostril on the coloured side; eyes on the right side, the upper slightly in advance of the lower, both small, the distance between them slightly greater than their diameter; the dorsal commences on the snout, the anterior rays small, simple, some on the back and posterior portion forked, no scales on the rays. Scales on the body ctenoid, with eight to ten spines, about eleven rows of scales from the eye to the cross line, along the lateral line; from thence 110 to 116 rows along the lateral line on to the tail; lateral line straight.

Colour light brown, crossed by narrow dark brown irregular narrow bands about as wide as the interspaces, extending on to the fins, some of the bands forked, about thirty-five or more on the body and head, four or five on the caudal fin.

A rather small plump species. A number were taken in the net at Manly Beach, September 11th, 1880, with *Solea microcephala*. I have dedicated this very distinct species to my esteemed friend the Hon. Wm. Macleay, F.L.S., &c.

LOTELLA GRANDIS, *sp. nov.*

B. 7. D. 9/52-54. A. 58.

The first two rays of the ventral fins produced, the second the longest, reaching to the vertical from behind the base of the pectoral; pectoral fin triangular, tapering; first dorsal separate, of nine spines. The mouth oblique, snout slightly turned up, lower part of forehead concave, the maxillary reaches one-third of the diameter of the eye behind the eye, the diameter of the orbit is five times in the length of the head; the height of the body at the commencement of the second dorsal is nearly equal to the length of the head, and is thrice and three-fourths in the length of the body, without the caudal fin. Snout once and a-third the diameter of the eye. Head thrice and two-thirds in the length without caudal, the barbel on the chin equal in length to the short diameter of the eye, less than the long; the width of the inter-orbital space equal to the snout. Vent opposite the fourth ray of the second dorsal. Nostrils close together. Teeth in viliform bands in the jaws, uniform, no larger series. The depth of the head is more than one-fifth greater than its width; the anterior dorsal fin commences behind the root of the pectoral; the length of the pectoral exceeds the distance from the posterior margin of the orbit to the upper angle of the gill covers. The ventral is inserted the length of the pectoral from its base, and is a little longer than the pectoral fin.

General colour reddish brown or light cinnamon, eye bright yellow; the pectoral fins orange; lips, gills, chin, and ventral fins orange-yellow; the anal, dorsal, and caudal fins reddish-brown with a distinct black margin.

Hab. Wollongong.

SPECIES OF EUCALYPTUS IN THE COUNTY OF CUMBERLAND: THEIR HABITAT AND USES.

BY THE REV. DR. WOOLLS, D.D., F.L.S., &c.

Part III.

Section III. RHYTIPHLOIÆ.

1. *E. acmenoides*, (Schau.) or the "White Mahogany," is a species which Mr. Bentham has united with *E. pilularis*, or the "Blackbutt." Baron Mueller (Decade 3.) speaks of it somewhat doubtfully as a distinct species, but I think that further inquiry

will prove that it is really so. The bark of the White Mahogany is similar to that of Stringy Bark, though not so fibrous; whilst the wood is very different from that of Blackbutt, being of a light colour, sometimes prettily waved, and of a satiny appearance. The trees also vary in habit and size, the White Mahogany being more of a forest tree than Blackbutt, and never, as far as I have observed, attaining the same height. The timber is useful for building purposes, palings, and flooring boards, and is heavier and more durable than that of Stringy Bark. Baron Mueller says of this tree, that "either as a variety or as a species it differs from *E. pilularis* in more fibrous outside paler and still more extensively persistent bark, further in leaves of smaller size, thinner consistence and beneath paler hue with only hypogenous stomata and more visible oil dots, in smaller flowers on thinner stalklets and less compressed stalks, smaller fruits with a narrower rim and often rather more enclosed valves." This species is common near Parramatta, and extends to the Blue Mountains and Illawarra. In its general appearance, it is so like Stringy Bark as to be mistaken sometimes for that tree; but no one, unless judging solely from dried specimens, would connect it with Blackbutt. This consideration convinces me, that the artificial system of classification is open to objection.

2. *E. botryoides*, (Smith), the "Bastard Mahogany" or "Bangalay" of workmen, occurring for the most part in moist sandy places near the coast, is seldom found to attain any great size in the neighbourhood of Sydney, and generally has a gnarled appearance. In the *Flora Australiensis* (Vol. III., p. 229), this tree has been placed together with *E. saligna* or the Blue Gum. There is certainly some resemblance in the flowers, fruit, and leaves, but the trees differ very much in bark, wood, and habit. Sir W. Macarthur, in referring to *E. botryoides* as it appears in the Southern Districts, calls it "a crooked-growing tree; the timber much valued for knees and crooked timbers of coasting vessels." This character agrees very well with the tree as seen

at Manly Beach. According to the Baron, who, in his *Eucalyptographia*, has furnished a very accurate figure of the species, "The shady and horizontal dark-green foliage of this beautiful tree gives it among Victorian species quite a peculiar and imposing aspect, reminding rather of an *Eugenia* than an *Eucalyptus*. Stems will occasionally attain a height of eighty feet without a branch and a diameter of eight feet." Unless this tree has been confused with *E. robusta*, or the "Swamp Mahogany," it must attain a greater size in Victoria than in New South Wales, whilst its mode of growth in the former colony is not remarked for its crooked or gnarled appearance. The specific name arises from the bunch-like form of the flowers and fruit, as they are close together and nearly sessile, but Baron Mueller thinks that the name *platypodus* given to it by Cavanilles in allusion to the flatness of the flower stalks, is more appropriate.

3. *E. robusta*, (Smith), or the "Swamp Mahogany" is one of our finest Eucalypts rising in low and swampy situations to 100 feet and upwards with a diameter of five to six feet, and well defined as a species by its large flowers, wide glossy leaves, and fruit sometimes exceeding half an inch in length. In the systematic arrangement of Mr. Bentham, it stands between *E. miniata*, and *E. botryoides*, but it differs from these species in fruit and foliage, as well as in its robust habit and proportionate height. According to Sir W. Macarthur, the timber is useful for inside work, but not equal to the better sorts of Eucalypts in strength and durability, whilst Mr. Moore, F.L.S., reports that it is much used for ship-building and wheelwright's work. I believe, speaking generally, that the wood is not so much valued as that of many Eucalypts, but that, never the less, it is utilized for rough furniture and also for mallets. This tree has been recommended for plantations and parks on account of its umbrageous character and ornamental appearance, but I have noticed, that in dry situations, it grows but slowly and seems stunted. Of all the species with which I am acquainted, none (with the exception of

E. globulus,) is so well adapted for counteracting the effects of malaria, or for absorbing the superfluous moisture in low grounds. *E. robusta* occurs in moist places, here and there, from Manly Beach to the Blue Mountains, though not extending into the interior, nor, as it appears from Baron Mueller's *Fragmenta* (Vol. II., p. 44) to the colony of Victoria. Its exact limits, however, remain to be defined.

4. *E. resinifera* (Smith). The specific name was originally applied to the "Broad-leaved or White Iron Bark" *(E. siderophloia)*, because that species is the most noted for its abundance of kino. By the arrangement of Mr. Bentham in the *Flora Australiensis* and the concurrence of Baron Mueller in his *Eucalyptographia*, the term *resinifera* is restricted to the Red or Forest Mahogany. This tree rises in favourable situations to 150 feet with a proportionate diameter, and although well known to practical men by its bark and wood, the flowers and fruit are very similar to some forms of *E. siderophloia* and *E. punctata*. The wood is extensively used for fencing, beams, rafters, and shipbuilding, and is regarded as being very strong and durable. In the neighbourhood of Parramatta, the flowers and fruit are comparatively small, but, on the Blue Mountains near Springwood and also in the Manly Swamps, they are much larger. Mr. Bentham regards the latter as variety *grandiflora*, though somewhat doubtfully, as he says it is very near *E. pellita*, and possibly referable to it. Baron Mueller's figure of *E. resinifera* gives a very good idea of the species generally, but the fruit of the Mountain variety is not only larger, but the valves are not so much exserted, and it wants the broadish outer ring around its orifice. This is the fourth of the trees popularly termed Mahoganies, though it may be remarked in passing that none of them bear any resemblance to the West Indian Mahogany. Whilst highly useful for the purposes indicated, they are not valued for fuel. *E. microcorys*, the Forest Mahogany of the

Northern parts of the Colony does not extend to Port Jackson. This species is famous for the so-called Tallow Wood.

5. *E. corymbosa*, (Smith), so called, because the flowers are generally in a terminal corymbose panicle, is the principal "Bloodwood" of the Colonists. The popular name is derived from the kino-secretions which are found in the concentric circles of the tree, or which exude from them in a liquid state. The flowers and fruits of this species are comparatively large, the former being sometimes an inch in length, whilst the seeds are winged. In the neighbourhood of Port Jackson, it appears stunted, but I have measured a tree near Parramatta which I found to be 112 feet, and Sir W. Macarthur reported from specimens seen further south an average height of 120 feet. The tree grows rapidly, and when young the wood is soft, but, in the older trees, it becomes hard, and stands well in damp ground. Though not to be compared in point of toughness or durability with some of the Iron Barks or Mahoganies, it is nevertheless utilized for posts, rails, and beams. The kino-sap is very abundant, and is likely to prove useful for industrial and medicinal purposes. According to the Catalogue of the Victorian Exhibition, 1861, the leaves are found to contain a valuable essential oil. "The yield from 100 lbs. of leaves was as follows: pure limpid oil 9 ounces 3 drachms, oil containing resinous matter in suspension 6 ounces 2 drachms; of the latter 50 per cent. of its volume may be estimated as consisting of solid matter upon which assumption the total yield may be approximately stated as 12 ounces 4 drachms" (see Report). Manna is sometimes found on the leaves of *E. corymbosa*, and the bark of the tree is useful for its fibre.

6. *E. eximia*, (Schau.) the "Smooth-barked," "Yellow," or "Mountain Bloodwood," seems to have derived its specific name from its proportionately large cream-coloured flowers and urceolate fruit, the latter sometimes nearly an inch in length. This, like *E. corymbosa*, is a large tree, rising 60 or 80 feet, but differing

from that species in the smoother and more scaly texture of the bark, the longer and more coriaceous leaves, and the double operculum similar to that of *E. maculata.* The range of this species has not been fully ascertained, but it occurs on the slopes of the Blue Mountains, the banks of the Grose and the Hawkesbury, the ranges near Bent's Basin, and in the northern parts of the colony. The wood is soft, light in colour, and liable to the attacks of grubs and white ants. It is not esteemed for carpenter's work or even for posts, but it is good for fuel. In the month of October, *E. eximia* may be seen flowering abundantly near the Railway-line beyond Emu, and then forming a conspicuous object amidst the dark foliage of the forest. The bark of this tree, which is about an inch or more thick is rather scaly than fibrous, of a yellowish colour, persistent on the butt and smooth on the smaller branches, and peeling off in flakes only in the outer layer. The bark differs from that of the other species in the section and resembles that of the broad-leaved Tea-tree, *(Callistemon salignus).* Mr. Bentham considers that *E. eximia* is more nearly allied to *E. maculata* than to *E. corymbosa*, though associated with the latter species from the fact that a red-coloured kino issues (but in less quantity) from the concentric circles of the wood. The leaves, which sometimes are eight inches long, are very thick, penniveined and reticulate, and full of volatile oil, an oil-cyst appearing in each of the reticulations.

7. *E. polyanthema* (Schauer), the "Lignum vitæ" or "Poplar-leaved Eucalypt" is figured by Baron Mueller in his third Decade and is one of those species of which the anthers are truncated and opening by terminal pores. In somewhat varied forms, it has a wide range, and sometimes rises to a great height, but in the County of Cumberland on the banks of George's River, the Nepean, and the Hawkesbury, it is a tree of very moderate size, remarkable for the copiousness of its flowers, the roughness and thickness of its bark, and the poplar shape of its leaves. The wood is close grained and exceedingly tough, of a dark colour

towards the centre, and, when of sufficient size, is useful for rough furniture, cogs, naves, and felloes. *E. polyanthema* resembles *E. populifolia* beyond the Dividing Range, but the trees differ in bark and habit, whilst, according to the Baron Mueller the latter has "leaves of lustrous green, less compound in florescence, smaller and more crowded flowers on shorter or hardly any stalklets, proportionately larger lid, stamens all fertile, anthers with more lateral openings, and filaments of darker colour and smaller fruits." The leaves of *E. polyanthema* are sometimes glaucous, especially when growing near a river or creek, and the operculum is double in the earlier stages of development. I have found a tree of this species occasionally amongst forest-trees in the neighbourhood of Liverpool and Richmond, but its proper habitat is near the banks of rivers or creeks. It does not occur so far as I have been able to ascertain, near Sydney or Parramatta, but according to Baron Mueller, the Southern variety prefers dry ridges and hills, or undulating country.

NOTES AND EXHIBITS.

J. Brazier, Esq., C.M.Z S,, &c., exhibited two fine specimens of *Voluta musica*, from Porto Rica, and a large one of the same species from Jamaica, West Indies, received from Mr. J. H. Thompson, of New Bedford; *Amphiperas hordacea*, living on *Gorgonia*, obtained at Kouei, New Caledonia, by Mr. R. C. Rossiter; and a new Conchological Work edited by Dr. E. von Martens of Berlin, entitled "Conchologische Mittheilungen als Fortsetzung der Novitates Conchologicæ," with six plates of coloured figures.

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WEDNESDAY, OCTOBER 27TH, 1880.

W. J. Stephens, Esq., M.A., Vice President in the Chair.

MEMBERS ELECTED.

Lieut. C. E. Beddome of Hobart Town.
The Rev. G. F. Macarthur of Parramatta.

DONATIONS.

Jahresbericht des Vereins fur Naturwissenschaft zu Braunschweig, 1880.

Royal Society of New South Wales, Journal and Proceedings, 1879.

South Australian Institute, Annual Report, 1879-1880.

Bulletin of the Museum of Comparative Zoology, Harvard College, Massachusetts, Vol. VII., No. 1.

PAPERS READ.

ON SOME NEW AUSTRALIAN MARINE ISOPODA—PART I.

BY WILLIAM A. HASWELL, M.A., B.Sc.

[Plates XVI.-XIX.]

The Edriophthalmata of the Australian Coast present probably on the whole, as numerous and prominent peculiarities as any other section of the marine fauna. Among the Amphipoda the genera *Cyproidia* and *Icilius*, are perhaps the most remarkable, and both must be regarded as occupying positions separated by considerable intervals from all other described forms ; but almost equally characteristic are such as *Amaryllis*, *Glycera*, *Xenocheira*, *Polycheria*, and *Wyvillea ;* though these find near allies among genera from other regions. Among the Isopoda of Australia, there are probably, almost as many peculiar and aberrant forms as among the Amphipoda, though the variety of species and the number of individuals are by no means so great in the former group as in the latter. As with the Amphipoda the home of the Australian non-parasitic marine Isopoda is among the luxuriant algæ and sponges in the temperate zone; the abundance and variety of the invertebrate life populating these miniature forests, in Port Jackson for example, being extremely great, and the Edriophthalms forming one of the most striking features. Further north both Amphipoda and Isopoda become very much rarer; among the algæ on the shores of Moreton Bay I have been able to detect but a very few species, and in Port Denison they become extremely rare.

Genus CODONOPHILUS, (*novum*).

Body slightly convex, abdomen markedly narrower than the thorax, with six free articulations; terminal segment lamellar; epimeræ distinct though small; head rather narrower than the first segment of the thorax. Eyes very large; antennæ sub-equal, stout, inserted under the head. Mandibles with elongate palpi. Maxillipedes small, operculiform, three-jointed. Thoracic limbs all anchor-like, with long dactyla. Posterior abdominal appendages free, uniramous.

Codonophilus argus, *sp. nov.*, Plate XVI., fig 1.

Eyes very large, extending on the under surface of the head. Thoracic appendages sub-equal, all with much elongate, curved and pointed dactyli. Ramus of abdominal appendages falciform with a few scattered cilia. Terminal segment scale-like, acuminate. Length 5/32 in.

Found under the bell of a *Rhizostoma* in Port Jackson.

This species approaches *Ægathoa*, Dana, in many respects; but differs from it in the sudden narrowing of the body at the commencement of the abdomen, and the uniramous character of the caudal appendages.

surface of the head, and extending on its under surf
side nearly to the margins of the buccal orifice.
separated at the base by a short frontal process;
about half the length of the inferior, the two basal
its peduncle together equal in length to the third se
flagellum longer than the peduncle, composed of
articuli; inferior pair with the flagellum more tha
length of the peduncle. Maxillipedes with the ter
plate-like, a strong spine at the internal and distal
first. Posterior thoracic limbs rather longer than
pairs; femora long-ovate; dactyla rather short. Re
appendages unequal, the inner longer and broader th
both ovate, obtusely pointed, ciliated on the margi
1 inch.

Hab. Holborn Island, near Port Denison, 20 fath
specimen).

Sphæroma aspera, *sp. nov.*, Plate XVI., fig

Body covered with larger and smaller granules.
verse, rounded in front, with a narrow lobe between
the antennæ; first segment of the thorax as broad
following; a slight depressed line marking off the epi
segment of the abdomen with distinct lines marking
of the coalesced segments, a prominent tubercle on t

very broad at the base; flagellum with twelve segments. Outer antennæ equalling the inner in length; flagellum with eight segments. Length ½ inch.

Hab. Port Jackson.

Sphæroma (?) anomala, *sp. nov.*, Plate XVI., fig. 4.

Body smooth, strongly convex, frontal region prominent; last segment of the thorax longer than the preceding five, produced in the middle line behind to an obtuse angle; first abdominal segment with a broad, shallow excavation in its posterior border, defined on either side by a minute, spinous process. Last abdominal segment with a transverse row of one central, larger, and two lateral, smaller tubercles; apex sub-acute, armed below on either side with a minute acute process. Rami of abdominal appendages ovate, sub-acute. Length 5/16 inch.

Hab. Port Jackson.

This species approaches *Isocladus* in the form of the last segment of the thorax, and *Cymodocea* in that of the last segment of the abdomen.

Sphæroma lævis, *sp. nov.*, Plate XVI., fig. 5.

Thorax nearly as broad as long, the first segment longer than the others, all the segments grooved and bent slightly backwards laterally—the lateral and posterior extremities of the segments subacute. Terminal segment of the abdomen smooth, convex, rounded distally. Caudal appendages narrow-lanceolate, blunt. Length 3/16 inch.

Hab. Bondi, near Sydney, on sandy beach.

Cymodocea pubescens, *Milne-Edwards, (sp.)* Plate XVII., fig. 1.

Sphæroma pubescens, *M.-Edw.*, *Hist. nat. Crust.* III., 209.

Strongly convex, tomentose. Frontal lobe obtuse. Antero-lateral angle of the first thoracic segment produced below the eye into a triangular acute lobe; postero-lateral angle similarly produced, rounded. Lateral angles of the following segments of the thorax produced, curved backwards, sub-acute. Penultimate segment of the abdomen produced behind into a rounded tubercle; a pair of sub-conical elevations on the last segment of the abdomen; notch very shallow, quadrangular; lobe pointed. Rami of caudal appendages rather unequal, both extending beyond the extremity of the segment, the outer the longer, the apex acute, curved outwards, the outer border with a conical tooth; the inner sub-acute. Basal joint of superior antennæ very broad, notched distally for the reception of the second joint. Flagellum of inner antennæ with twenty-seven articuli; that of the outer pair with twenty-one. Length of longest specimen one inch

Hab. Port Jackson etc.; common.

Cymodocea aculeata, *sp. nov.*, Plate XVI., fig. 6.

Body strongly convex, finely granular. First segment of the thorax twice as broad as the rest. Last segment of the abdomen with two prominent tubercles situated near the middle line, and two smaller ones external to them. Terminal notch very deep, quadrangular, the lateral processes triangular, central process very prominent, projecting slightly beyond the extremity of the lateral. Inner antennæ with the basal joints very broad and compressed, flagellum with twenty-two to twenty-five articuli. Outer antennæ rather longer than the superior pair; flagellum with about fourteen to sixteen articuli. Rami of caudal appendages sub-equal, outer ramus sub-ovate, with the outer border straight, the inner convex; inner ramus oblong, emarginate. Length 9/16 inch.

Hab. Port Jackson.

Cymodocea mammifera, *sp. nov.*, Plate XVIII., fig. 1.

Surface nearly smooth. Frontal lobe very small. Lateral angles of the thoracic segments rather blunt. Penultimate segment of the abdomen with two very small rounded elevations near its posterior margin. Second segment of the abdomen with a pair of low, mammiform elevations towards its middle; central lobe triangular, longer than those bordering the notch. Rami of caudal appendages sub-equal, pointed, sparsely ciliated. Length ⅜ inch.

Hab. Port Denison, Queensland.

Cilicæa tenuicaudata, *sp. nov.*, Plate XVII., fig. 2.

Surface obscurely granular. Postero-lateral angles of the segments of the thorax sub-acute Penultimate abdominal segment obscurely tubercular; median spine very long, extending far beyond the extremity of the abdomen, narrow, blade-like, bifurcate at the tip. Last segment of the abdomen with two rounded mammiform elevations; a deep mesial excavation at its posterior extremity. Peduncle of caudal appendages with a short spine representing the internal ramus; outer ramus ciliate, narrow, slightly curved backwards, extending rather beyond the extremity of the mesial spine, bifurcate at the tip. Flagella of antennæ each with about ten articuli. Length 5/16 inch.

Hab. Port Jackson.

Cilicæa crassicaudata, *sp. nov.*, Plate XVII., fig. 3.

Surface finely granular. Postero-lateral angles of the thoracic segments blunt. Penultimate segment of the abdomen slightly swollen; median spine rather short, not extending beyond the middle of the uropoda, thick, clothed with short cilia, apex entire, blunt. Last segment of the abdomen with two mammiform elevations; its posterior extremity deeply notched; notch with a low mesial lobe. Basal segment of the caudal appendages with a blunt process on its inner border; mobile ramus sub-cylindrical, ciliated, curved inwards, extending beyond the extremity of the median spine, apex rounded, entire; immobile ramus rudimentary. Length ⅓ inch.

Hab. Holborn Island, 20 fathoms (a single specimen).

Calyptura carnea, *gen. et sp. nov.*, Plate XVII., fig. 4.

Moderately convex, granulated. Head of moderate size, rather broader than long, eyes oval, received into a notch in the anterior border of the first segment of the thorax. First segment of the thorax broader than the succeeding five; lateral angles blunt. Last segment of the thorax produced into a broad shield extending beyond and concealing the abdomen, narrowing behind to a blunt apex, convex anteriorly, nearly flat in its posterior half, but with a slight median longitudinal ridge. Abdomen short, bisegmented, concealed by the last thoracic segment; last segment with a quadrangular median posterior notch, in the centre of which is a squarish lobe. Caudal appendages extending slightly beyond the extremity of the last thoracic segment; rami subequal, ciliated on the edges, the inner the longer, truncate, with an angular tooth on its inner border; outer ovate, pointed, the extremity slightly curved outwards. Inner antennæ broad at the base, separated by a small frontal lobe, flagellum of eleven or twelve articuli. Outer antennæ longer than the inner, flagellum of fourteen or fifteen articuli. Colour crimson. Length ⅛ inch.

Hab. Port Jackson; common.

Genus HALIOPHASMA *(novum)*.

Body sub-cylindrical, depressed, thoracic segments sub-equal. Inner antennæ much shorter than the outer, with multi-articulate flagellum. Mandibles with a palp. Maxillipedes small, sub-operculiform. First pair of thoracic limbs large, sub-chelate, the rest simple or the second imperfectly subchelate. Last pair of abdominal appendages broad, operculiform, biramous—the inner ramus biarticulate, the outer scale-like. Terminal segment squamiform.

Differs from *Paranthura* in the possession of well-developed flagella in both pairs of antennæ or the outer pair only, and in the form of the second and third pairs of pereiopoda.

Haliophasma purpurea, *sp. nov.*, Plate XVIII., fig. 2.

Head and first thoracic segment flattened; last thoracic segment shorter than the others. Inner antennæ as long as the head, slender; flagellum rudimentary. Outer antennæ nearly twice as long as the inner pair; the peduncle very stout, the flagellum with seven articuli. First pair of thoracic limbs very thick, with stout, ovate propodos and strong dactylos; the following pairs all non-subchelate rather short, decreasing in size posteriorly. Terminal segment rounded at the apex, with three longitudinal dorsal ridges. Colour reddish-purple. Length ⅞ in.

Hab. Port Jackson.

Haliophasma maculata, *sp. nov.*, Plate XVIII., fig. 3.

Head and first segment of the thorax slightly flattened. Inner antennæ as long as the head; flagellum with about twenty articuli. Outer antennæ twice as long as the inner; flagellum with numerous articulations. First pair of thoracic limbs large, similar to those of the preceding species; following pairs rather long, the first two prehensile. Terminal segment not longitudinally ridged. Terminal segment, caudal appendages and caudal scale fringed with long hairs. Colour light yellow, with black blotches. Length ¾ inch.

Hab. Port Jackson.

Paranthura australis, *sp. nov.*, Plate XVIII., fig. 4.

Eyes very minute. Antennæ extremely short, with rudimentary flagella, the internal pair rather the longer, First pair of thoracic limbs with the carpus somewhat produced superiorly and distally; propodos ovate, dilated proximally; the palm armed with a row five stout spinules. Second pair rather smaller than the first and of similar shape; palm armed with six ciliated spinules. Third pair smaller than the second. Caudal scales sub-circular; ramus of caudal appendages ovate, sub-acute, hairy. Terminal segment rounded. Length about ½ an inch.

Hab. Port Jackson.

Paranthura (?) crassicornis, *sp. nov.*, Plate XVIII., fig. 5.

Eyes very small. Internal antennæ very short, about half the length of the head; flagellum with several short articuli. External antennæ twice as long as the internal pair; flagellum thick, twice as long as the peduncle, composed of numerous articuli. First pair of thoracic limbs larger than the others; propodos ovate. Second and third pairs rather smaller than the first, and of similar shape. Following pairs sub-equal, with the dactylos long and falciform. Length 5/16 inch.

Hab. Port Jackson.

Differs from *Paranthura* in the form of the outer antennæ.

Genus STENETRIUM *(novum)*.

Body dorso-ventrally compressed; abdomen short, one-jointed. Head with a short rostrum. Antennæ inserted on the anterior margin of the head; internal pair very short; external pair very long, both with well-developed flagella. Mandibles provided with a palp. Maxillipedes expanded, operculiform. First pair of thoracic limbs with a large prehensile manus; following pairs ambulatory. First pair of abdominal appendages broad, operculiform. Caudal appendages biramous, inserted on the border of the shield-like abdomen near the extremity.

Stenetrium armatum, *sp. nov.*, Plate XIX., fig. 1.

Cephalon armed on either side with a prominent dorso-ventrally compressed, acute spine, curved outwards and forwards. Antero-lateral angles of the first thoracic segment produced forwards, acute; those of the second segment slightly produced; postero-lateral angle of the penultimate segment slightly produced backwards. Penultimate segment of the abdomen rudimentary;

second as long as the three last thoracic segments, its lateral border marked behind the middle by an angular notch, bounded behind by an inconspicuous acute spine; a short, rounded mesial lobe at the posterior extremity. Eyes narrow, oblique. Internal antennæ scarcely as long as the three basal joints of the external pair, flagellum longer than the peduncle. External antennæ about four times as long as the inner pair, longer than the body; basal joint of the peduncle produced externally and distally into a slender acute process; second joint similarly produced, the process ending in a hair-like appendage; flagellum about equalling the peduncle in length, formed of numerous articuli which are very short proximally and increase slightly in length towards the distal end. Maxillipedes with the four basal joints forming a broad operculum; terminal joint well-developed. First pair of thoracic limbs in the male very large; ischium, meros and carpus sub-equal, the meros produced infero-distally into an acute process; propodos large, irregularly ovate, palm defined by a long acute spine, and armed in addition with a bifid denticle situated about its middle; dactylos powerful, sub-acute. Following pairs of thoracic limbs sub-equal. Inner ramus of caudal appendages longer than the outer, both lanceolate, armed laterally with slender hairs. Length ½ inch.

The female has the first pair of thoracic limbs smaller than in the male, the palm unarmed, concave, defined by a projecting acute angle.

Hab. Port Jackson, among algæ a few feet below low-water mark.

Stenetrium inerme, *sp. nov.*, Plate XIX., fig. 2.

Head transverse, rostrum sub-acute. Lateral borders of anterior thoracic segments not much produced, bilobed. Lateral border of last abdominal segment entire; with an obscure, rounded, mesial lobe. Eyes rounded. Internal antennæ very slender, less than a quarter of the length of the external pair; basal joint of the peduncle very short and broad, second narrower and slightly longer, third scarcely distinguishable from the flagellum; flagellum about twice as long as the peduncle. External antennæ longer than the body, the three basal joints of the peduncle short and stout, the third the longest of the three and provided distally and externally with a short, acute spine; flagellum shorter than the peduncle. Penultimate joint of the maxillipedes not expanded. First pair of thoracic limbs large; propodos sub-triangular in outline, the palm transxerse, concave, armed with a few short bristles, and defined by a prominent acute tooth; dactylos much longer than the palm. Following pairs of thoracic limbs decreasing slightly in length posteriorly. Caudal appendages with the inner ramus longer than the outer, both broad-lanceolate, truncate, with one or two lateral notches and a few long, slender setæ. Length about 5/16 inch.

Hab. Port Jackson.

EXPLANATION OF PLATES XVI.-XIX.

In all the figures *a*—inner antennæ; *b*—outer antennæ; *c*—first pair of pereiopoda; *d*—mandibles; *e*—first pair of maxillæ; *f*—second maxillæ; *g*—maxillipedes; *x*—terminal segment or caudal appendages.

Plate XVI.

Fig. 1. *Codonophilus argus*, five times the natural size.
,, 2. *Rocinela vigilans*, natural size.
,, 3. *Sphæroma aspera*, seven times the natural size.
,, 4. *Sphæroma anomala*, four times the natural size.
,, 5. *Sphæroma lævis*, five times the natural size.
,, 6. *Cymodocea aculeata*, twice the natural size.

Plate XVII.

Fig. 1. *Cymodocea pubescens*, natural size.
,, 2. *Cilicæa tenuicaudata*, three times the natural size.
,, 3. *Cilicæa crassicaudata*, three times the natural size.
,, 4. *Calyptura carnea*, four times the natural size.

Plate XVIII.

Fig. 1. *Cymodocea mammifera*, three times the natural size.
„ 2. *Haliophasma purpurea*, three times the natural size.
„ 3. *Haliophasma maculata*, three times the natural size.
„ 4. *Paranthura australis*, nine times the natural size.
„ 5. *Paranthura* (?) *crassicornis*, five times the natural size.

Plate XIX.

Fig. 1. *Stenetrium armatum*, seven times the natural size.
„ 2. *Stenetrium inerme*.

NOTES ON RECENT MOLLUSCA FOUND IN PORT JACKSON AND ON THE COAST OF NEW SOUTH WALES AND OTHER LOCALITIES WITH THEIR SYNONYMS.

By J. BRAZIER, C.M.Z.S., &c.

1. POLYTROPA STRIATA.

Buccinum striata, Martyn, Univ. Conch., pl. 7, ed Chenu., pl. 3, fig. 1. *Buccinum orbita-lacunosa*, Chem., Conch. Cab., X., fig. 1473; *Buccinum lacunosum*, Brug. *Purpura rugosa*, Lam., An. Sans Vert., Vol. VII., p. 242. *Purpura rupestris*, Valenciennes; *Purpura succincta*, var., Reeve, Conch. Icon., without figure. *Polytropa striata*, Hutton, in Jour de Conch. 1878, p. 19, and Manual of the New Zealand Mollusca, 1880, p. 56.

Hab. Point Piper, Port Jackson; Wallaroo, South Australia; Bondi Bay *(W. H. Hargraves)*.

This somewhat common species is recorded by Professor Hutton from Chatham Islands, Auckland Islands, Auckland to Stewart's Island, and South Australia; my specimen was obtained twenty years ago at Wallaroo, by my kinsman Mr. R. C. Rossiter. Mr. Angas could not have found it, as there is no record of it in his Molluscan Fauna of South Australia, (Proc. Zool. Soc., 1865.)

The *Purpura textilosa*, Lam., mentioned by the Rev. J. E. Tenison-Woods in his Census of Tasmanian Shells is this species. It has not been previously recorded from Port Jackson; a specimen in the Museum in the Hargrave's Collection, is labelled Bondi Bay, Australia.

2. VOLVA DEPRESSA.

Ovulum depressum, Sowb., Jun. Pro. Zool. Soc., 1875, p. 128, pl. 24. fig. .

Hab. North-west coast of Australia *(Capt. Denicke).* Isle Amede near Nouméa, New Caledonia *(R. C. Rossiter).* Bampton Reef *(Brazier).*

I have two specimens of this very rare species obtained many years ago on the Bampton Reef, found on a branch of *Madrepore.* One specimen has been recently found by Mr. R. C. Rossiter at New Caledonia. Mr. Sowerby describes it as a narrow, depressed *Ovulum*, produced in front, both ends attenuated and terminating in two points, polished, very finely striated, white, tinged with orange at the extremities; base concavely depressed; aperture narrow, rather more open towards the hinder part.

The base is slightly tinged with light yellow in my specimens. There is one specimen in the Hargrave's Collection in the Australian Museum without locality. I may mention that the French have taken possession of the Bampton Reef, Chesterfield Reef and Islands, and consider them dependencies of New Caledonia.

3. NASSA COMPACTA.

Nassa compacta, Angas, Proc. Zool. Soc., 1865, p. 154.

Hab. George's Bay, Tasmania *(Mr. Aug. Simson).* St. Vincent's Gulf, South Australia *(Mr. Angas).*

This species I have very often had sent to me from the amateur collectors of Tasmania, named *Nassa rufocincta*, A. Ad., the *N.*

compacta is a small thick shell and allied to *N. incrassata*, Mull., found on the English Coast.

The *Nassa rufocincta*, mentioned by the Rev. J. E. Tenison-Woods in his Census of Tasmanian Shells, Proc. Roy. Soc., Tasmania, 1877. p. 29, and found by Mr. R. M. Johnston at Pig Island, Tamar, is I believe *N. compacta*, Angas.

4. ANACHIS SPECIOSA.

Columbella (Anachis) speciosa, Angas, Proc. Zool. Soc., 1877, p. 35, pl. 5, fig. 3.

Hab. Port Jackson, New South Wales; George's Bay, Tasmania *(Mr. Aug. Simson)*.

This very pretty little species I received from Mr. Simson, it agrees in every respect with the typical form from Port Jackson.

5. FASCIOLARIA TRAPEZIUM.

Murex trapezium, Linn., Syst. Nat. ed 12, p. 1224. *Faciolaria trapezium*, Lam., Am. San. Vert. tome 7, p. 119, Tenison-Woods', Census of Tasmanian Shells, Proc. Roy. Soc., Tas., 1877, p. 30.

Hab. Amboina *(Rumphus)*. Great Indian Ocean *(Lamarck)*. Philippine Islands *(Cuming)*. Brazil (*D' Orbigny*). Port Wiseman Florida Island, Solomon Archipelago, found on the Reef under blocks of coral (*Brazier*).

This species never was found in Tasmania as quoted by the Rev. J. E. Tenison-Woods, it may have been brought to Tasmania by some of the Whale ships from the Pacific Islands, and fallen into the hands of Mr. Legrand. During the cruise of H.M.S. Curaçoa we collected a large number of specimens in a very short time. I have another instance of foreign shells being introduced into the Tasmanian Seas: Some twelve months ago Mr. Augustus Simson, L.S., sent me a large *Olive* for name; some persons living on Flinder's Island, Bass's Straits, gave it to him and distinctly told him that they found it on the beach near their place; when I received the specimen I examined it very closely and detected a great deal of plaster of Paris on the under side. I believe the specimen had been taken off a fancy shell work box; it was *Oliva gibbosa*, a species very common at Ceylon. About fifteen years ago one of our Port Jackson fishermen brought me a large specimen of *Murex ramosus*, Linn., and declared that he brought it up in his fishing net at Vaucluse. It had the appearance of having been in some garden for twenty years; five shillings was asked for it; eventually the same specimen was sent to me as being from the South Sea Islands. I could relate a good deal about Port Jackson fishermen of the old school, boarding the Whalers and Island Traders and buying up all the old shells and selling them to any Foreigner about Sydney as from Port Jackson. When in a curiosity shop one day in Sydney a gentleman happened to come in who wanted a collection of shells from Port Jackson, of about 50 species that he picked out more than 25 came from New Caledonia and Solomon Islands such as *Strombus canarium*, *Epidromus gibberulus*, *Pterocera lambis*, *Cypræa tigris*, &c.

6. NERITINA SOUVERBIANA.

Neritina Souverbiana, Montrouzier, Jour de Conch., 1863, Vol. XI., p. 75-175, pl. 5, fig. 5. *Neritina* (*Vitta*) *pulcherrima*, Angas, non Mousson, Proc. Zool. Soc., 1871, p. 19, pl. 1, fig. 25. *Neritina* (*Vitta*) *pulcherrima*, Braz., Proc. Linn. Soc., N.S.W., 1877, Vol. II., p. 21. *Neritina Souverbiana*, Von Martens, in Martini an Chemnitz, Conchylien-Cabinet, pl. 23, fig. 29-31.

Hab. Sow and Pigs Reef, Port Jackson, five fathoms; Cape Grenville, North-east Australia, twenty fathoms; Evan's Bay, Cape York, North Australia, seven fathoms; Darnley Island, Torres Straits (*Brazier*). Art and Pot Islands, New Caledonia, found on marine Fucus (*Montrouzier*).

I quite agree with Dr. E. von Martens that Mr. Angas' *N. pulcherrima*, is only a synonym of *N. Souverbiana*, Montr. I recently received three specimens from New Caledonia, and if mixed up with my Port Jackson and Torres Straits examples they could not be separated. M. Mousson described a *Neritina pulcherrima* in the Journ de Conch., 1857, p. 164, from Menado, in the Island of Celebes, but it is in no way related to *N. Sowerbiana*, Montr.

7. SCALARIA GRANULOSA.

Turritella granulosa, Quoy. Voy. de l Astrolabe Zool., pl. 55, fig. 29—30. *Scalaria granulosa*, Sowb., Thes. Conch., pl. 35, fig. 144. *Scala* (*Opalia*) *granulosa*, Angas, Proc. Zool. Soc., 1865, p. 168.

Hab. Port Jackson under the inner North Head, five fathoms (*Brazier*). Aldinga Bay, Guichen Bay, South Australia (*G. F. Angas*).

Of this very rare species I obtained one fine living specimen some time ago. During the winter gale of 1868 Mr. Hargraves procured specimens at Lake Macquarie. When living the animal ejects a fine violet blue liquid that stains the shell for many months; the animal of *Scalaria Australis*, does the same. The Rev. Mr. Tenison-Woods quotes *S. granulosa* from Bass's Straits only; it appears strange that this shell should only be quoted from there when it was found by Messrs. Quoy and Gaimard and Mr. G. Angas, in other parts of Australia. It is very rare at the present time in Australian and European Cabinets.

8. SAXACAVIA ANGASI.

Saxacavia Angasi, A. Adams.—Angas in Proc. Zool. Soc., 1865, p. 643. Tryon, Jr. Catalogue of Saxicavidæ, 1869, p. 59. Reeve, Conch. Icon , pl. 2. sp. 11.

Hab. Off Balls' Head, Port Jackson, eighteen fathoms, bottom of broken shells and large living Ascidians, Cirripedes and sponge.

This fine species is covered with a fine thin yellowish-brown epidermis, the specimen in my possession which I removed from a large piece of sponge is eighteen lines long, thirteen lines broad, at the posterior end finely wrinkled, anterior end smooth. It is quite distinct in every respect and need never be confused with *Saxicava australis*.

9. MERCENARIA PAUCILAMELLATA.

Mercenaria paucilamellata, Dunker, Novitates, Conchologicæ 1858, p. 52, pl. 16, fig. 10, 11—12. *Venus alatus*, Reeve, Conch. Icon., 1163, pl. 18, fig. 83. *Chione* (*Circomphalus*) *alatus*, Angas, Proc. Zool. Soc., 1867, p. 921. *Callista Victoriæ*, Tenison-Woods, Proc. Roy. Soc., Tas., 1876, p. 171.

Hab. New Holland (*Leschke*). Port Jackson Heads, Wollongong, Port Stephens and Lake Macquarie, New South Wales (*Angas*, *Hargraves*, *Brazier*). Circular Head, North Tasmania; Cloudy Bay on the South of Bruny Island and Frederick Henry Bay, Tasmania (*Rev. H. D. Atkinson*). Swan River (*Reeve*) the New Holland of the old authors.

The figures given of the adult specimens by Dr. Dunker are very fine of this nearly smooth species, broadly rayed with pale brown, with a few erect ridges at the posterior side. The young shells are more or less distinctly ridged throughout. One specimen that I have is more like *Chione lamellata*, having six distinct ribs and terminating at the anterior end in long points or prongs and canaliculated on the upper side, prongs four lines long, length of specimen fourteen, breadth ten lines; another valve I have has the prongs in the centre of the ribs; two more specimens have four lamellated ribs and two elongated canaliculated erect prongs on each rib at the anterior end, length eleven, breadth seven lines; one specimen with two small ribs wide apart each rib with three prongs slightly curved down at the end: one nearly in the centre, the other two near the anterior end and terminating in a broad lamellated prong at the posterior end, length six, breadth four and a-half lines. One specimen with four prongs on the edge of a very indistinct rib: one lamellated prong at the posterior end, the second nearly in the middle, third on the angle, fourth rather long an the anterior end, length five, breadth three and a-half lines; another specimen having two thin, nearly obsolete slightly lamellated ribs, with four prongs on each rib disposed in the same manner as the previous specimen, this is the smallest of the series, length four and a-half, breadth three and a-quarter lines. Adult specimens measure twenty-six lines long, twenty lines broad, the Tasmanian examples are a little broader.

The valves of this species are crenulated at the margins and could be classed in either *Mercenaria* or *Chione;* in *Callista* the margins are entire and never crenulated.

10. HEMICARDIA DONACIFORMIS.

Cardium donaciforme, Schrœter, Vin. 3, p. 68, pl. 7, f. 14.—Reeve, Conch. Icon., pl. 5, sp. 25. *Cardium australiense,* Reeve, Proc. Zool. Soc., 1844, p. 168. *Cardium Donaciforme,* Hanley Catalogue Recent Bivalve Shell, p. 144. *Cardium australiense,* Angas, Proc. Zool. Soc., 1867, p. 925.

Hab. Port Jackson Heads, Lake Macquarie, Port Stephens, New South Wales, (*Brazier*). Port Lincoln (Harvey).

The name given to this species by Reeve I think was quite uncalled for. I doubt if it was found at Port Lincoln, South Australia. Mr. Angas does not mention it in his list of South Australian Shells, so he could not have found it. Mr. Bednall or Professor Tate have not I believe met it there. I believe it is confined to the east coast of Australia. During the Chevert Expedition we did not procure any specimens, either in Torres Straits or on the north-east coast. The late Mr. Cuming obtained his specimen at the Philippine Islands, and none knew better than Mr. Cuming the value of a new species, so Mr. Reeve described the Australian form as a new species on account of a slight difference in colour. I have eighty specimens dredged out side Sydney Heads, there are not two alike in colour or marking in the series; a very fine lot for a species maker. The specimens from Port Stephen are very fine, they measure twenty-one lines long, breadth fourteen lines. From Lake Macquarie, fifteen lines long, ten lines broad. Sydney Heads, largest specimens eleven lines long, six lines broad; smallest specimens five lines long, three lines broad.

I quote Mr. Reeve's remarks on his so called species. "This shell may be chiefly distinguished from *Cardium Donaciforme* to which it is in many respects allied by the contracted flexuous prolongation of the posterior portion, and by the peculiarity of one half of the shell being conspicuously grooved whilst the other half is smooth and shining."

This description corresponds to about five specimens out of eighty-three; in old specimens there are very few grooves, others again have radiating grooves from end to end.

SPECIES OF EUCALYPTUS IN THE COUNTY OF CUMBERLAND: THEIR HABITAT AND USES.

BY THE REV. DR. WOOLLS, D.D., F.L.S., &c.

Part IV.

Section IV. PACHYPHLOIÆ.

In referring to the species of this section, I think it necessary to state that I have always felt some difficulty respecting the trees popularly termed "Stringy Barks," for, though they differ in the size and shape of the leaves, the configuration of the fruit, and the comparative value of their wood, yet they all agree pretty well in the texture of their bark and the shape and opening of their anthers. Whether placed under the cortical or artificial system, therefore, they must stand close to each other. Until very recently, the specific name of *obliqua* was applied to all the forms of Stringy Bark, and it is very remarkable that Mr Bentham, although he knew nothing of the trees excepting from dried specimens and the notes of the collectors, saw that they all had a near alliance to that species (*E. obliqua*). Thus, in describing *E. capitella*, he remarks "nearly allied to *E. obliqua*, this species appears to differ slightly in the thicker leaves with rather less oblique veins, and more essentially in the sessile flowers and fruits, and in the shape of the fruit." Of *E. macrorrhyncha*, he says, "Although allied to *E. obliqua*, this is readily distinguished by the buds, and especially by the shape of the fruit"; whilst of *E. eugenioides*, which he regarded as a variety of *E. piperita*, or the common Peppermint, he adds "This species is sometimes difficult to distinguish in the dried state from some forms of *E. obliqua*." Under these circumstances, it seemed not unreasonable to regard the three forms of Stringy Bark, as varieties of the same species, differing from each other in proportion to their proximity to the sea-coast, their elevation above the sea-level, or the geological formation of the soil. This view appeared to be confirmed by the fact that Willdenow, in his "*Species Plantarum*" published in 1799, places *E. obliqua* amongst the Port Jackson Eucalypts, and also by the consideration that our early Botanists called the Stringy Bark by that name. It was not until the publication of the third Decade of Baron Mueller's *Eucalyptographia* that the amalgamation of the forms under *E. obliqua* seemed untenable, for that learned writer proves beyond a doubt that the typical *E. obligua* was first noticed in Tasmania, and that, in its ordinary form, it scarcely extends to New South Wales. Such being the case, it may be well, in the present state of our inquiries, to speak of the three forms of Stringy Bark found in different parts of the colony, as three distinct species. Very little importance should be attached to the shape and texture of the leaves or to the commercial value of the timber, as constituting specific difference, but there is a difficulty in combining forms which differ in the shape of their fruit. It is true, that in some species of Iron Bark (*E. siderophlora*) and of Mahogany (*E. resinifera*), the fruit varies sometimes in shape and size, but, then, the uniform shape of the leaves and the general character of the wood prevent us from concluding that such deviations are anything more than varieties of the same species. With regard to size especially, this seems to be true, for, in damp sandy places near the coast, the fruit of the latter is sometimes three or four times as large as it is inland to the Blue Mountains.

1. *E. capitella*, (so called from the capitate flower buds of the umbels) is the common form of Stringy Bark near the sea-coast, and then, after passing over the county of Cumberland, it is found again on the Blue Mountains, where it is distinguished from the other form by the name of "Broad-leaved or Silvery Stringy Bark." As found near Sydney, it is only a tree of moderate size, but, according to Baron Mueller, it attains a height of 200 feet in favourable localities to the South. The young seedlings of this species, as well as those of *E. eugenioides*, and *E. macrorrhyncha*, are beset with minute tufts of hair, the leaves appear nearly opposite, and the fruit is hemispherical. This tree was one of the first Eucalypts made known to European Botanists, for it is figured in White's Voyages to New South Wales, and is described in Willdenow's "*Species Plantarum*," in which it is said to be distinguished from other species by its capitate flowers. The operculum is generally figured as hemispherical, but the form, especially near Sydney, varies to conical. With regard to the wood, different opinions are entained, for, whilst Sir W. Macarthur (*Catologue of the Natural and Industrial Products of New South Wales*, 1867), says that the coast species is preferable to that of Camden, workmen generally speak more favourably of the kind which occurs as a forest tree between the coast and the mountains. Sir William gives 120 feet as the greatest height of *E. capitella*, and he memtions as a curious fact that the Blacks had different names for the coast and inland trees.

2. *E. eugenioides*, is the name now appropriated to the common Stringy Bark from Port Jackson to the Blue Mountains. As Mr. Bentham placed this species with *E. piperita*, there was some difficulty in identifying it, but recent investigation has shown that

it is the same as *E. scabra*, *E. penicellata*, and *E. acervula*, having narrower leaves than the other Stringy Barks, and differing also in the pale colour of the wood. The leaves are very unequal at the base and the fruit is small, not capitate, and the rim comparatively narrow. As a bush tree, Stringy Bark rises from 60 to 100 feet, and is associated with Box (*E. hemiphloia*) and Grey Gum (*E. tereticornis*), having frequently a spreading habit, and flowering regularly in the summer. It is a very useful tree, for the wood is available for flooring boards, weather boards, door-frames, shingles, fencing and paling, whilst the bark can be utilized not only for covering rustic buildings, but also for the manufacture of door-mats, paper, ropes, &c. I have been told by practical men that Stringy Bark Shingles have been known to last for 20 years, whilst a friend at Mudgee assures me that the same tree, (as distinguished from the Red Stringy Bark), furnishes a very durable timber, the posts of it having stood in the ground for 40 years. The quality, however, differs according to the soil, for, in some parts, it is not esteemed, whilst everywhere it is but an indifferent wood for fuel. According to Baron Mueller, to whom we are indebted for a technical description of the species under the name of *E. acervula*, it occurs from Botany Bay to the Macleay River, and is allied systematically to *E. piperita*.

3. *E. piperita*, is the common Peppermint of Port Jackson, so called, because in the early days of the colony, it was remarked that the volatile oil extracted from the leaves had in its scent a great resemblance to Peppermint. This tree which grows to great size, though generally spreading in its habit and not remarkable for its height, extends here and there from the coast to the Blue Mountains. Its bark which is not so fibrous or thick as that of Stringy Bark, covers the butt, but not the smaller branches, and on account of its greyish appearance, it is sometimes called, especially to the Southward, "White Stringy Bark." Differing from *E. capitella* and *E. eugenioides* in the shape of the fruit, the comparative thinness of the leaves, and in their less obliquity at

the base, there is also a marked dissimilarity in their seedlings, for whilst the leaves of the young Stringy Barks are rough, nearly opposite, and lanceolate, those of the Peppermint are smooth and roundish. Mr. Bentham considered *E. eugenioides*, or the White Stringy Bark to be a variety of *E. piperita*, but as the trees differ not only in the parts specified but also in their bark, wood, and habit, the opinion is inadmissible. The wood of the Peppermint has a bad reputation, being regarded as useless for fencing and carpentry, as well as for fuel. In the progress of inquiry, no doubt, it will be found applicable to some industrial purpose, but this is the character given to it by a recent writer: "Hard to kill, hard to grub, difficult to burn, and useless for all splitting purposes, it is a nuisance to the farmer, whether alive or dead." The occurrence of the Stringy Barks and Peppermint seems to be intimately connected with the geological formation of the soil, for whilst *E. capitella* and *E. piperita* prefer what is termed the Sydney sandstone or Hawkesbury Rocks, *E. eugenioides*, is the species found most frequently on the Parramatta Beds. Thus, for instance, *E. capitella*, is found in the neighbourhood of Port Jackson, and then, again on parts of the Blue Mountains where the formation is similar. The same remark may be made respecting *E. piperita*, for, though occurring at Manly Beach, on the Creeks to the north of Parramatta, and also on the rocky banks of the Parramatta River, it passes over a considerable portion of tne County and appears again on the Blue Mountains. I am not aware that *E. macrorrhyncha* is to be found on this side of the Dividing Range, but, on the sides of the hills beyond Mudgee, it is one of the forms of Stringy Bark, preferring a porphyritic whinstone and felspar. This subject was discussed in a paper by Mr. W. Christie, read before the Royal Society in November, 1876, in which my eminent friend the late Revd. W. B. Clarke, took an especial interest, but as I did not see Mr. Christie's specimens, I can only observe, that one of the Stringy Barks in New England prefers "granite and elvanite soil," whilst the other is found "where the rock approaches in its granular character to the nature of sandstone." The latter appears to me to be *E. macrorrhyncha*, as the seed vessel is reported to attain a large size, but in order to form any definite opinion of geological influences, the whole matter needs careful investigation.

ON A YOUNG SPECIMEN OF A TEMNOPLEURUS.

By THE REV. J. E. TENISON-WOODS, F.G.S., F.L.S.

[Plate XV., figs. 3, 4, and 5.]

The species here described was dredged up from a few fathoms at Port Denison. It appears to me to belong to the genus *Temnopleurus*, and as far as I can judge belongs to a new species. It is principally distinguished by the extent and depth of the pits on the coronal plates. Unfortunately there are no perfect specimens and the anal system is entirely wanting. There are two single rows of large tubercles (primary) in each area, and secondaries are scattered in irregular double lines on the ridges between the sutural pits. On the ambulacral area this line is close to the pores, which are a single row of double pores. On the interambulacral area there is a very irregular line of secondaries between the line of pores and the row of primaries. The tubercles have a conspicuous smooth base and a rather large area which is also smooth. The sutural pits are regularly oval, and equally deep. The shape of the test is circular and depressed not conical. The actinosome is large, round, without cuts and the arches are broad, rather high, solid, united above and connected with one another by hood processes.

Prof. A. Agassiz has given us such full information about the young stages of *Temnopleurus* that we are able to pronounce at once upon any small urchins belonging to the genus. The specimen in question does not belong to *T. Hardwickii*, as in that species the sutural pits are altogether wanting on the actinal surface, while here they are as conspicuous as on any part of the test. *Temnopleurus Reynaudi* has a conical outline and the pit are different. In *T. tornematicus*, the secondary tubercles for oblique lines and the portion of the ambulacral plates which lie between the sutural cavities has a band-like character.

From all these circumstances I regard the urchin here figured as new, I do not think we are dealing with a very young stage, but as I cannot give any information or surmise about the adult state, I name the species only provisionally and distinguish it as *Temnopleurus cavernosa.*

DESCRIPTION OF A PARASITIC SYNGNATUS.

BY E. P. RAMSAY, F.L.S., &c.

SYNGNATUS INTESTINALIS, *sp. nov.*

Operculum with a ridge. Body elongate, quadrilateral, with four distinct ridges, lateral line ridged, almost confluent with the upper ridges of the tail; dorsal ridges of the body ending with the dorsal fin, which is composed of thirty rays, rather high, and occupies five of the caudal and half of the last body ring. Body rings sixteen, nuchal ridge on three nuchal plates, the dorsal ridge overlaps the caudal at the dorsal fin, and ends with the last dorsal ray; the lower caudal ridge continuous with the abdominal; the tail about half as long again as the body, the anus in front of the dorsal, each ring ending in a small, sharp, spine; the folds of the egg pouch in the male occupy about one third of the extent of the caudal portion; the snout is very slightly shorter than the remainder of the head, the width of the head at the gill covers is one third of the head—including the snout.

Body flesh colour, dorsal ridges and caudal fin orange, fourteen to sixteen dark bands on the body very indistinct on the under side of the tail; head, with minute blackish striæ above, black dots on the snout, two black lines on either side of the gill covers one on the centre of the throat, the first three rings with a broad black band (or two confluent spots) below.

Hab. The intestinal cavity of *Holothuriæ.*

NOTES AND EXHIBITS.

Mr. Ramsay exhibited a tooth of a Marsupial allied to *Diprotodon* for which he proposed the name of *Sceparnodon* from the adze-like character of the upper incisor. Also several specimens of *Fierasfer* (two species) and a number of *Sygnathidæ* and an almost colourless *Eleotris,* which had lived as "Messmates" in the interior of a large *Holothuria.*

Mr. Brazier exhibited a beautiful species of *Lepralia* from the Harbour, and the third part of the Conchology of New Caledonia, by J. B. Gassies.

Mr. Hobson exhibited Mineral specimens from the Solomon Islands, consisting principally of decomposed trap, calcspar, and jasperised slate.

WEDNESDAY, NOVEMBER 24TH, 1880.

The Vice-President, W. J. Stephens, Esq., M.A., in the Chair.

The Hon. Secretary announced that the Council had elected E. B. Sanger Esq., of Adelaide a Corresponding Member of the Society.

MEMBERS ELECTED.

Dr. Joseph Beattie, Parramatta.
Mr. Crofft, Survey Office.

DONATIONS.

Meddelanden af Societas pro Fauna et Flora Fennica, Mittheilungen aus der Zoologischen Station zu Neapel, 1880.

Manual of New Zealand Coleoptera, by Capt. T. Broun.

Mr. Brazier on behalf of J. H. Thomson Esq., New Bedford, Mass., presented the Society the following works, which he stated were of singular value to Australian Naturalists: Testacea Nova Australiæ, Morelet. Metz., 1857; and Molluscorum Novæ Hollandiæ specimen, Menke, Hanover, 1843.

PAPERS READ.

LIST OF SPECIES OF PORCELLANA OR CYPRÆA FOUND IN MORETON BAY, QUEENSLAND.

BY J. BRAZIER, C.M.Z.S., &c.

I have been requested by numerous correspondents in New South Wales and Queensland to publish in the Proceedings of this Society a Catalogue of the species of *Cypræa* found in Moreton Bay, as the Conchological Works on the subject published in England and Europe are very seldom to be found in the library of young beginners. Last year I wrote a paper on the Moreton Bay species of *Cypræa* and it was published in the English Journal of Conchology, Vol. II., p. 317, a work seen only by a few in these Colonies.

A few remarks on Moreton Bay may be of interest. It was on the 17th of May, 1770, the celebrated circumnavigator, Captain James Cook, dropped anchor from the bows of the good ship "Endeavour," in the waters of a large inlet on the eastern coast of Australia, to which he gave the name of 'Moreton Bay,' in honour of his patron the Earl of Moreton, the then President of the Royal Society. The bay is an extensive sheet of water separating Shadbroke and Moreton Islands from the mainland. It is about forty miles long, north and south, and seventeen miles broad. Stradbroke Island is thirty-three miles long, north and south, and seven miles broad. Moreton Island is twenty miles in extreme length about north and south, and five miles in breadth near the north end. Very few good working collectors have ever visited Moreton Island, with its extensive range of long sandy beaches with large stones that can be turned over at low water spring tides. In the bay there are smaller islands and sandbanks with shoals on which dredging can be carried on with but little trouble. The only persons who did any good dredging in the bay were the late Mr. Fred. Strange and young Mr. Spurling, who unfortunately lost their lives in the service at Percy Island No. II., by being killed by the aborigines.

This list is made out from those species collected by the late Mr. Charles Coxen, of Brisbane, Queensland, he having paid frequent visits to various parts of the bay. He was busy arranging his valuable discoveries and corresponding with me up to the time of his death in July, 1876. I am under great obligation to Mrs. Coxen in her endeavours to assist me with the use of her lamented husband's papers and notes.

CYPRÆA.

1. CYPRÆA ASELLUS, Linn.

Reeve, Conch. Icon., pl. 18, fig. 98.

Bribie Island; one dead specimen found.

2. CYPRÆA FELINA, Gmel.

Reeve, pl. 19, fig. 105.

Stradbroke Island, on banks under big hill.

3. CYPRÆA CARNEOLA, Linn.

Reeve, pl. 6, fig. 19.

Stradbroke Island; one dead specimen found.

4. CYPRÆA ISABELLA, Linn.

Reeve, pl. 12, fig. 51.

Bribie Island; one dead specimen found.

5. CYPRÆA MACULA, A. Ad.

Sowb. Thes. Conch., pl. 32, fig. 380.

Shell of a greyish colour, freckled with chestnut, dark spots round the basal margin; back with a conspicuous large chestnut blotch.

Stradbroke Island, on coral banks.

Sub Genus ARICIA.

6. CYPRÆA ANNULUS, Linn.

Sowerby, Thes. Conch., pl. 26, fig. 252.

Stradbroke Island; very common on all the banks off the island.

Mrs. Coxen says, "We had at one time 800 specimens a great deal finer in colour than those figured by Mr. Sowerby in Thes. Conch." I am of the same opinion, having obtained large numbers from Port Denison and Torres Straits that put the figure of Reeve and Sowerby into the shade.

7. CYPRÆA ARABICA, Linn.

Reeve, Conch. Icon., pl. 1, fig. 2.

Stradbroke Island, on coral banks; common.

8. CYPRÆA CAPUT-SERPENTIS, Linn.

Reeve, pl. 11, fig. 44.

Shell somewhat squarely ovate, depressedly flat; teeth conspicuous, rather elongated, thirteen or fourteen on the inner and outer lip; blackish brown, back ornamented with unequal, round, white specks and dots, pale fulvous spot at each extremity, base dirty white.

Amity Point, Stradbroke Island; few obtained.

9. Cypræa caput-anguis, Philippi.

This species was sent to me for name and marked Moreton Bay; I consider Moreton Bay a very wide term. This was described by Philippi, 1849, in the German Conchological Work, Zeitschrift fur Malakozoologie, p. 24.

Shell oblong ovate, very much convex with the sides thickened and angulated; blackish-brown, convex at the base; aperture with sixteen teeth on each side, thicker on the outer side, interstices milky-brown, back dotted with white, extremities whitish.

It might be taken for a variety of *caput-serpentis*, but it is quite distinct and was figured by Martin Lister in his Hist. Conch., 1770, pl. 701, fig. 49, and pl. 704, fig. 53.

Sub Genus LUPONIA.

10. Cypræa angustata, Gmel. (Non Gray).

Sowerby, Thes. Conch., pl. 28, fig. 296—297.

Colundra, north end of Moreton Bay, one dead specimen found.

I doubt this species having been found in Moreton Bay; its home is Tasmania. I have never seen the northern shell, but I think Mr. Coxen's identification must be wrong, or Tasmanian shells may have got mixed up with Moreton Bay examples of other species.

11. Cypræa caurica, Linn.

Reeve, pl. 11, fig. 46.

Dunwich, Stradbroke Island; not common.

12. Cypræa clandestina, Linn.

Reeve, pl, 19, fig. 106.

Cypræa moniliaris, Lamark.

Stradbroke Island; found on the banks under big hill.

13. CYPRÆA CRUENTA, Gmelin.

Reeve, Conch., pl. 10, fig. 38.

Cypræa variolaria, Lam., *C. morbillosa*, Sol., MS.S., Dilln. Cat., *Porcellana variola*, Rumph.

Burleigh Heads; one dead specimen found.

14. CYPRÆA EBURNA, Barnes.

Reeve, pl. 9, fig. 35.

Stradbroke Island; very rare.

15. CYPRÆA EROSA, Linn.

Reeve, pl. 11, fig. 43.

Stradbroke Island; found on coral banks.

16. CYPRÆA ERRONES, Linn.

Reeve, pl. 13, fig. 56.

Cypræa ovum, Gmel, *C. subflava*, Gmel., *C. olivacea*, Lam.

Stradbroke Island; common on all the coral banks.

17. CYPRÆA FLAVEOLA, Linn.

Reeve, pl. 18, fig. 95.

Stradbroke Island; on the banks under the big hill; not common. This species must not be confounded with the *C. flaveola* of Lamarck, which is the *C. spurca* of Linn., or the *C. flaveola* of Born, which is the *C. rufa*.

18. CYPRÆA HELVOLA, Linn.

Reeve, pl. 15, fig. 72.

Cypræa citrina, Kiener, (non Gray.)

Stradbroke Island, under the big hill, not common.

Mrs. Coxen sent me this named *C. citrina*, Gray, they are both quite distinct and need not be confused. *C. citrina* is very rare, my specimen comes from Madagascar.

19. CYPRÆA LUTEA, Gron.

Reeve, pl. 20, fig. 110.

Cypræa Humphreysii, Gray.

Stradbroke Island, under big hill; rare.

The two specimen in my collection received from Mrs. Coxen are one inch in length; the variety *C. Humphreysii* is very rare, it is banded with two milky blue zones.

20. CYPRÆA LYNX, Linn.

Cypræa Vanelli, Linn., *C. squalina*, Gmel., *C. Caledonica*, Crasse., var.

Stradbroke Island; rare.

21. CYPRÆA SAULÆ, Gask.

Reeve, pl. 14, fig. 62.

Peel Island; only one specimen found.

This magnificent and rare species was first procured from the Philippine Islands, the specimen in my collection was obtained by a native diver at Warrior Reef, Torres Straits, six fathoms, found on a branch of *Millepora*.

22. CYPRÆA SUBVIRIDIS, Reeve, pl. 13, fig. 48.

Southern end of Moreton Bay.

23. CYPRÆA TIGRIS, Linn.

Reeve, pl. 4, fig. 12.

Cypræa flammea, Gmel., *C. tigrina*, Gmel.

Peel Island; not common.

Mr. Samuel Stutchbury found a young living example beautifully coloured, at Bribie Island in 1854. This is Mr. Coxen's note.

24. CYPRÆA VITELLUS, Linn.

Reeve, pl. 5, fig. 14.

Cypræa dama, Humph., *C. fulva*, Gmel.

Stradbroke Island; rather common.

25. CYPRÆA WALKERI, Gray.

Sowerby, Thes. Conch., pl. 18, fig. 123-125.

Peel Island; two only have been found.

This rare species I obtained during the Chevert Expedition to New Guinea in 1875, first at Palm Island, eleven fathoms sandy mud bottom; Cape Grenville, North-east coast of Australia, eight fathoms, white sand; Darnley Island, Torres Straits, twenty to thirty fathoms, white sand.

Mr. W. A. Haswell, M.A., B.Sc., dredged two examples off Port Denison, October 1879.

26. CYPRÆA XANTHODON, Gray.

Sowerby, Thes. Conch., pl. 23, fig. 196, 197-513.

Dunwich, Stradbroke Island, on the coral banks; rare.

27. CYPRÆA ZIGZAG, Linn.

Reeve, pl. 18, fig. 97.

Peel Island; only one found.

It is interesting to know that Mr. Coxen obtained this fine and well known species in Moreton Bay, I believe it is the first recorded Australian habitat.

I am of opinion that *Porcellana* of Rumphius, Amboyna Rarit. p. 113, 1705, should have priority over *Cypræa* of Linn., Syst. Nat., p. 1172, 1766. The following list will show the superiority of Rumphius' claim:

1.	*Porcellana aselli,*	Rumph.	*Cypræa asellus,*	Linn.
3.	„ *carneola,*		„ *carneola,*	
4.	„ *Isabella,*		„ *Isabella,*	
13.	„ *variola,*		„ *cruenta,*	Gmel.
23.	„ *guttata,*		„ *tigris,*	Linn.
24.	„ *salita,*		„ *vitellus,*	

The numbers refer to the species mentioned in this paper, as *Cypræa.*

Species of Eucalyptus in the County of Cumberland: their habitat and uses.

By the Rev. Dr. Woolls, D.D., F.L.S., &c.

Part V.

Section V. Schizophloiæ.

1. *E. paniculata,* varies in the colour of the wood from white to red, and, therefore, is sometimes called "White," and sometimes "Red Ironbark," whilst, on the Blue Mountains, the pale variety has the name of "Brush Ironbark." Although this tree appears in the interior in a stunted form, it rises in the counties of Cumberland and Camden to the height of 120 feet, and the bark is smoother and more uniform than that of the allied species. The wood of *E. paniculata,* especially in the pale variety is very, hard and tough, and, according to Sir W. Macarthur, is "the most valuable of all the Ironbarks," being highly prized by wheelwrights for shafts, spokes, and cogs or for any purposes where strength and durability are required. The leaves vary in size and shape from ovate-lanceolate to narrow-lanceolate, and, in dried specimens, var. *angustifolia* is only to be distinguished from *E. crebra* by having its outer stamens anantherous, although practical men easily distinguish them by their wood and bark. This tree prefers a better soil than some of its congeners, and, on the Blue Mountains, it appears as a forest tree. Baron Mueller

justly remarks, in reference to it, "that we can best distinguish *E. paniculata* from *E. siderophloia* by the less deeply furrowed bark, by the frequent difference in the coloration of the leaf-pages, by the shorter calyx-lids, the sterility of the outer stamens, the infraction of all filaments while in bud, the terminal openings of the anthers, and the dilated stigma and perfectly enclosed fruit-valves." Though nearly allied, however, the two trees stand in different sections under the artificial system.

2. *E. siderophloia*, is the "broad leaved" or rough Ironbark, one of the strongest and most durable of colonial timbers, and originally called *E. resinifera*, because from it the Botany Bay kino was procured very plentifully. The popular names of this species are very confusing, as the term "broad leaved" is equally applicable to some forms of *E. paniculata*, whilst that of "Red Ironbark" is more suitable for *E. crebra*, as that species is more uniform in the colour of its wood There are two forms of *E. siderophloia*, varying in the size of the leaves, flowers, and fruit, and particularly in the length of the operculum. In the form, which Mr. Bentham ragards as typical of the species, the leaves are sometimes lanceolate and somewhat falcate, the operculum conical and rather longer than the calyx-tube, the fruit seldom exceeding two lines, and the valves scarcely protruding. This form seems to include a tree common in some parts of the country and growing in company with the typical *E. siderophloia*, but called "Black Box" and "Ironbark Box." Mr. T. Shepherd, who for many years past has paid attention to our Eucalypts, states "that the wood of the Black Box is so like that of the common Ironbark that it may easily be mistaken for it; but it is not the least like the wood of the common Box. The saplings at first sight are very like the Box, but the upper branches, unlike those of the Box, have rough bark extending almost to their extremities. When you strip off a piece of the bark, you find that, after a minute or two, the juice, on exposure to the air, turns red like that of Ironbark, whilst that of the Box remains a

yellowish white. Woodmen are in the habit of passing off the wood of this tree under the name of Ironbark, and the Government Inspectors do not notice any difference." The form designated var. *rostrata* has the operculum about half an inch in length or more, the fruit four lines in diameter, and the valves of the capsule somewhat prominent, whilst the rim is usually thicker. The leaves, likewise, are larger and broader; being frequently more than six inches in length, and more than two in breadth. Sir W. Macarthur remarks, in reference to this tree, "It is distinguishable by its very rough bark, in broad, deep, longitudinal furrows, its very broad leaves, its smooth bark on the young branches, and the different grain of the wood." So far as I have had opportunities of observing, there does not appear to be much difference in the quality of the wood in the varieties of this species, but there is not the same uniformity in the bark. Though inferior as a timber to that of *E. paniculata*, it is very much esteemed for railway purposes, piles, and fencing, standing for many years in the ground, and bearing a great amount of pressure. It is not used for carpentry, as it is hard to work, and unsuitable for boards or veneering, on account of its tendency to warp when cut up as sawn stuff. For the most part, this tree indicates poor soil, growing sometimes in stony places, especially in red sand stone, where it appears to derive little nutriment from the ground. In the neighbourhood of Parramatta, it is found in company with *E. crebra* and *E. paniculata*, but between Richmond and St. Mary's, it is rather associated with *E. sideroxylon*.

3. *E. crebra*, which is commonly known as the narrow-leaved or Red Ironbark, is a tree of considerable size, rising to 100 or 120 feet in height with a proportionate diameter. Though occurring frequently on poor soil, it is found on grassy flats in the county of Cumberland, and also on the lower parts of the Blue Mountains, as a forest tree. The leaves of this species are lanceolate and sometimes very narrow; the bark dark, hard, and furrowed; and the wood generally of a red colour. *E. crebra*

flowers from October to the end of the year, and, in that respect, is more regular than some of the allied species. Baron Mueller, who has given an excellent figure of this tree, says that the frequent occurrence of it through a large extent of East Australia suggested the specific name. It appears from the observations of that eminent writer, that this Ironbark extends from the southern shores of the Gulf of Carpentaria, through the more littoral and hilly tracts of Queensland to the vicinity of Port Jackson and the Blue Mountains. According to the artificial system *E. crebra* stands in the same section with *E. siderophloia*, though, in its general character, it approaches more closely to the narrow-leaved forms of *E. paniculata*. The wood is very hard and durable, being largely used for fencing, railway purposes, and wheel-wright's work. According to the experiments mentioned by Baron Mueller, the wood is not so strong as that of *E. siderophloia*, and that is the general impression of practical men; but, in order to form an accurate estimate of the comparative strength of the respective woods, they should be nearly of the same age, for old timber becomes somewhat brittle.

4. *E. leucoxylon* var. *sideroxylon* is the Red-flowering Ironbark, occurring for the most part on poor soil at South Creek, near Richmond, and between Parramatta and Liverpool. It is seldom found, on this side of the Dividing Range, to exceed 60 or 80 feet. The bark is very dark in colour, deeply furrowed, and, abounding in kino. As the wood is the darkest of the Ironbarks the specific name is very inappropriate, whilst the term *sideroxylon* seems applicable to all the series. The Victorian and South Australian tree, with which, according to the artificial system, our Red-flowering Ironbark is associated, has white wood and "a rough dark iron-grey bark" (F.v.M.), but both of the trees have similar flowers and the upper branches white and smooth. Baron Mueller suggested the name *rubiflora* for our variety, but finding that, beyond the Dividing Range, the tree very frequently had white flowers, he has returned to Cunningham's *sideroxylon*. The

wood of this Ironbark is the least esteemed of the four species, to which our Ironbarks are now referred. Though more easily worked, and sometimes used for the naves of wheels, and also for piles and posts standing in the ground (for which purposes it seems adapted), it does not split well, nor is it considered durable. When in flower, the smaller trees have an ornamental appearance, for the blossoms resemble those of the Peach, and the drooping foliage is somewhat pale and silvery. As far as I have observed, this tree does not occur on the Hawkesbury Rocks, but prefers the red sandstone.

Though the Eucalypts of the county of Cumberland do not rise to the towering height of those in Victoria and Western Australia, nor have any of the species acquired so much celebrity as the far-famed *E. globulus*, yet they afford timber for a great variety of purposes; whilst their leaves, resin, and bark may be utilized in many ways which the progress of science is continually revealing. It is to be lamented, that in the early days of the colony, so many valuable trees were destroyed in the process of burning off, and that farms, in the neighbourhood of Sydney and Parramatta, have been completely denuded of timber. The indiscriminate destruction of such trees has not only deprived the cattle of shelter, but, in some places, there is a scarcity of timber for fencing or fuel, which will render it necessary ere long to reverse the policy of former days, and to raise again, if possible, forests of despised gum trees. I have long considered, that, on economic, as well as on sanitary grounds, it is very imprudent to slay the giants of the forest merely to get them out of the way, and I have remonstrated especially on the folly of ring-barking valuable Ironbarks for the temporary purpose of increasing the growth of the grass. Such trees may yet be wanted, and it may take a longer time to raise them than many suppose. And this leads me to remark, in conclusion, that whilst some Eucalypts are rapid in growth, others require centuries for their full development. This consideration may account in some measure, for the very different opinions which men of science have expressed on the subject. The Rev. J. E. Tenison-Woods, F.G.S., and F.L.S., in a paper entitled "*Tasmanian Forests: their Botany and Economic Value,*" asserts, on the testimony of a gentleman who has had great experience in such matters, that the tallest trees of the forest, the giant timber of Tasmania, range from fifty-one to seventy-five years old. Sir William Denison, on the other hand, arrived at the conclusion, from observations which he made near Hobartown, that *E. globulus* continues "its upward growth in deep nutritive soil for about 80 years, after which space of time, the tree will only enlarge in the girth of its stem and branches." Baron Mueller regards this gum tree as a species of longevity, but he thinks that Professor Langethral has erred greatly in allowing it an age of 2300 years! The fact is, as pointed out by the Rev. J. E. Tenison-Woods, and also by the learned Baron, little reliance can be placed on any estimate based on the rings of wood added to the diameter each year, because "the less regular intermediate rings between the annual layers of wood, apt to be formed in trees of the zone of evergreen vegetation, are easily mistaken for the results of a year's growth." Whatever may be the ages of the Tasmanian Eucalypts, I believe that the harder woods in the county of Cumberland are slow in growth, and that centuries elapse before they reach their full proportions. Some years since when I was residing in Parramatta, I came to the conclusion (from observing trees which had sprung up since the formation of the settlement, and also from measuring two trees that had been planted by the late Miss Elizabeth Macarthur half a century previously) that the growth of some species is by no means rapid, and that the Ironbark (*E. sideroxylon*) had not made more than a foot in diameter in fifty years. The Blackbutt (*E. pilularis*) and the Cumberland Blue Gum (*E. saligna*) are generally regarded as trees of rapid growth, but I believe, as I remarked in my "*Contribution to the Flora of Australia,*" p. 223, that "differences of soil, the prevalence of drought, the ravages of insects and fungi, the damages arising from storms, and many other causes of an injurious character, tend to retard the progress of our gums, and to make their growth exceedingly irregular."

This, however, is a subject which remains to be fully investigated, and I may add that it is one of considerable difficulty; for unlike many plants, which may be cultivated in the same soil and with similar conditions, our Eucalypts (numbering as they do between 100 and 200 species and extending from nearly 40° S. to nearly 10° N.) require very different soil and temperature for their proper development. Under these circumstances, therefore, more reliance is to be placed in calculations formed on the bases of natural growth in native forests, than on the rearing of trees from seeds by any artificial process. This calculation, indeed, might be partially effected, so far as some of the Cumberland species are concerned, by the accurate measurement of trees which have been known to spring up since the early days in paddocks once cleared. It is true that the observation would not extend to many species, but it would be important as ranging over a period of eighty or ninety years The Tasmanian Stringy Bark *(E. obliqua)* is reported to be a tree of very rapid growth, attaining full proportions in fifty or sixty years; but this cannot be said of the Stringy Bark *(E. eugenioides ?)*, which has been growing near Sydney and Parramatta since the beginning of the century, and which yet appears to be only in its infancy. I have never had sufficient leisure to go deeply into the question of the comparative ages of our Eucalypts, but I hope, as Baron F. von Mueller proceeds with his *Eucalyptographia*, he will extend the observations, which he has already made on the subject in describing the properties of *E. globulus*. It is interesting to notice from remarks of that eminent writer that some forms of *E. amygdalina* (one of which occurs in the western portion of the county of Cumberland under the name *E. radiata)* are more rapid in growth than the far-famed *E. globulus*. Let us hope that the Baron may pursue this matter to a satisfactory conclusion, and clear up the mystery which yet hangs over the ages of our gigantic Eucalypts. He has already accomplished a great work in publishing seven decades of his *Eucalyptographia*. May he be spared by a kind Providence to bring his labours to completion.

Descriptive Catalogue of the Fishes of Australia.

By William Macleay, F.L.S., &c.

Part II.

Division II. ACANTH. BERYCIFORMES.

Body compressed, oblong or elevated; head with large muciferous cavities, covered with thin skin only, Ventral fins thoracic, with one spine and generally more than five soft rays.

Family X. BERYCIDÆ.

Genus Monocentris, Bl.

Muzzle blunt, round, protruding, with the cleft of the mouth beneath; eye moderate. Villiform teeth in the jaws and on the palatine bones, none on the vomer. Eight branchiostegals, opercles scarcely denticulated; suborbital bones with radiating ridges. Scales large and forming a coat of mail; several isolated spines before the dorsal. Ventrals with two short rays, caudal fin not forked.

Japan and Australia.

313, Monocentris japonicus, Cuv. & Val.

Gunth. Cat. Fishes I., p. 9.—Bleek, Atl. Ichth. Trachich., pl. 2, f. 4.

D. 6/11. A. 10. P. 13. V. 1/2. L. lat. 13. L. transv. 2/4.

Anterior dorsal and ventral spines very strong and thick. Head shorter than the height of the body.

Port Jackson, very rare.

Genus TRACHICHTHYS, Shaw.

Muzzle very short, rounded, not protruding; cleft of the mouth oblique; chin prominent; eye large. Exceedingly fine villiform teeth in both jaws, on the vomer, and on the palatine bones. Eight branchiostegals. A strong spine on the scapular bone and at the angle of the præoperculum, a small one on the operculum; suborbital arch with radiating ridges. Scales ctenoid rather small; abdomen serrated. One dorsal fin; ventral with six rays; caudal forked.

Australia and New Zealand.

314. TRACHICHTHYS AUSTRALIS, Shaw.

Gunth. Cat. Fishes I., p· 10.

D. 3/12r A. 2/10. P. 13.

Scales rough, those of the lateral line not larger; the serrated ventral keel composed of eight scales. The height of the body not quite one half of the length between the snout and the base of the caudal.

New Holland (Gunther), Shaw's original specimen.

315. TRACHICHTHYS JACKSONIENSIS, *n. sp.*

Trachichthys australis, Castelnau, Proc. Linn. Soc., N.S. Wales, Vol. III., p. 364.

Count Castelnau when he described this fish believed it to be the *T. australis* of Shaw. It is however, evidently quite distinct, the height of the body is rather more than half the length (without caudal) and the ventral keel is composed of from nine to eleven scales. Colour reddish, cheeks darker with a light band on the posterior margin of the præoperculum. All the fins, except the pectoral, black, broadly margined with yellow.

Port Jackson.

316. Trachichthys elongatus, Gunth.

Gunth. Cat. Fishes I., p. 10, pl. 1, fig. A.

D. 4/11. A. 3/9. V. 1/6. L. lat. about 65.

Scales rough, those of the lateral line not larger; the serrated ventral keel composed of eleven or twelve scales. The height of the body one-third of the length between the snout and the base of the caudal.

Australia, (young specimen, Gunth.) New Zealand.

Genus Beryx.

Muzzle short. Mouth very oblique. Eye large. Villiform teeth in the jaws and on the vomer and palatine bones. Opercles serrated, præoperculum without spine. Scales rather large. One dorsal fin; ventrals with seven or more rays; caudal forked; anal with four spines. Air-bladder simple; pyloric appendages in increased number (20-30).

Sea of Madeira, Indian and Australian Seas.

317. Beryx affinis, Gunth.

Gunth. Cat. Fishes I., p. 13, pl. 2.—Casteln., Proc. Linn. Soc., N. S. Wales, Vol. II., p. 225.

Nannegai of the Sydney aborigines.

D. 7/12. A. 4/12-13. V. 1/7. L. lat. 41-43. L. transv. 6/12.

(For full description see Castelnau, *loc. cit.*)

East Coast of New South Wales.

Genus Myripristis, Cuv.

Muzzle short, cleft of mouth oblique. Eye generally large. Villiform teeth in the jaws and on the vomer and palatine bones. Eight branchiostegals. Opercular bones serrated. Operculum with a spine, præoperculum without. Scales large, ctenoid. Two dorsal fins, scarcely united; ventrals with seven rays; caudal forked; anal with four spines. Swim-bladder divided by a contraction; the anterior part extending to the otocrane. Pyloric appendages in moderate number.

Tropical Seas.

318. MYRIPRISTIS AUSTRALIS, Casteln.

Researches on the Fishes of Australia, p. 4.

D. 10. 1/14. A. 4/13. L. lat. 33.

Height of body contained twice and one-fourth in the length (without caudal); eye very large, a little over twice in the length of the head; the interocular space is twice and one-third in the same; the maxillary bone is not denticulated; the operculum forms posteriorly a small angle but has no spine, above the angle it is striated and the edge is crenulate. The scales are large, long, and strongly crenated. Caudal fin deeply forked. Colour silvery-pink, beneath white, each scale of the back has a broad edge of dark purple. Length four inches.

Cape York.

Genus NEOMYRIPRISTRIS, Castelnau.

Scarcely differs from *Myripristis* except in its dentition, which consists of a series of small, sharp, curved teeth in each jaw, with transverse series of sharp teeth on the vomer and palatine bones.

Australia.

319. NEOMYRIPRISTIS AMÆNUS, Casteln.

Proc. Zool. Soc., Victoria, Vol. II., p. 99.

D. 10. 1/15. A. 4/14. V. 1/7. P. 14. C. 19. L. lat. 35.
L. transv. 9.

Height three times in the total length; head thrice and a-third in the same; eye twice and one third in the length of the head, which is very convex anteriorly; the maxillary is striated and reaches to the vertical from the centre of the orbit; the infraorbital bone, præoperculum, and operculum are serrated, the latter has a rather long spine, beneath which are two shorter ones, over the long spine is a rather deep indent, surmounted by a spine of moderate length. Colour in spirits of a brilliant golden hue, with the back greyish, the head and fins bright yellow. Average length of specimens two and a-quarter inches.

Torres Straits.

Genus HOLOCENTRUM, Artedi.

Muzzle moderate, cleft of mouth nearly horizontal, eye large. Villiform teeth in the jaws, on the vomer and palatine bones. Eight branchiostegals. Opercular and suborbital bones serrated, operculum with two spines, præoperculum with a large spine at the angle. Scales moderate, ctenoid. Two dorsal fins scarcely united; ventrals with seven rays; caudal forked; anal with four spines, the third very long and strong. Swim-bladder simple, oval; pyloric appendages in increased number.

Tropical Seas.

320. HODOCENTRUM RUBRUM, Forsk.

Gunth. Cat. Fishes I., p. 35.—Bleek., Atl. Ichth. Trachich. pl. 3, f. 4.

D. 11/12-13. A. 4/9. L. lat. 35-37. L. transv. 3/6. Cæc. pylor. 20. Vert. 11/16.

The height of the body is equal to the length of the head, (opercular spine included) and three and a-half times in the total length; the space between the eyes is one-fifth of the length of the head. The groove for the processes of the intermaxillary much shorter than the diameter of the eye. Operculum with two strong, prominent spines, the lower of which is the smaller. The third, fourth, and fifth. dorsal spines the longest; the soft dorsal fin rather higher than the spinous; lobes of the caudal fin equal; the third anal spine very long and strong; the ventrals reach nearly to the anus and are rather longer than the pectorals, Scales scarcely striated. Red, with eight whitish longitudinal bands; the outer edges of the caudal fin blackish; the ventrals whitish, black between the third spine and first ray.

Port Darwin.

This species has a very wide range throughout the Indian and Chinese seas, but has never been mentioned before as Australian.

Genus NEONIPHON, Casteln.

Two dorsal fins slightly united; scales adherent, large and ctenoid; body oblong; anal fin with three spines, the last of these of very great size. Opercles with long spines. Teeth numerous, villiform, none on the palatine bones; tongue smooth; ventrals with seven rays.

Australia.

321. NEONIPHON ARMATUS, Casteln.

Researches on the Fishes of Australia, p. 5.

Body elongate, somewhat convex above and almost straight beneath; height three times and two-thirds in the length without the caudal fin, head twice and three-quarters in the same; eye very large, its diameter contained three times in the length of the head, and equal to the length of the snout; lower jaw longer than the upper; suborbital bone very strongly serrated; cheeks covered with rather small scales; præoperculum finely serrated, with a long spine at the lower angle; operculum crenulated and armed on its upper part with two long spines; upper part of head naked, the frontal bones covered with radiating grooves posteriorly; space between the eyes broad, with four feeble longitudinal ridges. L. lat. 38-40. First dorsal fin with eleven spines; the third longest. Second dorsal 1/12 high and narrow; Anal 3/9, the third spine equal to the height of the body; caudal bilobed. Colour pink, beneath silvery, top of head and back purplish; an obscure longitudinal stripe extends from the operculum to the base of the tail; on the back, cheeks and lower part of the body are numerous round spots, which form irregular lines, a very large black spot on the membranes between the first, second, and third dorsal spines. Length of specimen 17 inches.

Cape York.

DIVISION III. ACANTH. KURTIFORMES.

One dorsal fin only, which is much shorter than the anal, which is long. No superbranchial organ. One family only.

FAMILY XI. KURTIDÆ.

Genus PEMPHERIS, Cuv. & Val.

Body compressed, oblong; eye large; cleft of mouth oblique, lower jaw prominent, snout very short. One short dorsal fin with six spines. Anal elongate, scaly, with three spines. Scales rather small. Villiform teeth in the jaws and on the vomer and palatine bones. Seven branchiostegals; air-bladder divided into an anterior and posterior portion. Pyloric appendages in moderate number.

Indian Ocean, Australia, Tropical Pacific.

322. PEMPHERIS COMPRESSUS, White.

Gunth. Cat. Fishes II., p. 508.

D. 6/10. A. 3/36. L. lat. 68.

The height of the body is one-third of the total length; caudal fin bilobed, the upper lobe much longer than the lower. Colour rosy-brown, with a bright golden yellow lateral line, the anterior edge of the dorsal fin, and the greater part of the anal and ventrals black.

Port Jackson, Swan River.

323. PEMPHERIS MACROLEPIS, *n. sp.*

D. 4-5/12. A. 3/36. P. 16.

Height of body twice and two-thirds in the total length; eye very large, its diameter more than half the length of the head, and covered with a loose skin. Scales large, more particularly behind the pectoral fin; lateral line extending to the extremity of the tail and consisting of about sixty scales. Caudal fin moderately forked. Colour silvery, with small brown spots towards the back and tail, fins of a dullish colour. Eye yellow.

King George's Sound. Port Jackson.

Genus NEOPEMPHERIS, *nov. gen.*

Body oblong, compressed. Eye moderate; cleft of mouth large, slightly oblique; teeth very numerous, small and acute in the the jaws, on the vomer and palatine bones, with one or two series of cardiform teeth in each jaw. Scales small.

Australia.

324. NEOPEMPHERIS RAMSAYI, *n. sp.*, Plate XIV.

D. 4/16. A. 3/26. L. lat. 78. L. transv. 10/15.

Height of body about one-fourth of the total length, and length of head one-fifth; snout rounded and rather shorter than the diameter of the eye; space between the eyes convex and broader than the orbit; submandibular space narrow, that, and all parts of the head, except the front of the snout, closely covered with minute silvery scales. The spines of the dorsal fin increase in length regularly from the first to the fourth, and seem to be fixed to the front of the first ray, the rays decrease in length as they go backwards and the fin altogether has a falciform appearance; the anal is of similar shape, but longer; both fins are covered with minute scales; the caudal is moderately emarginate, the pectorals are short, so are the ventrals, which are situated just under the pectorals. The colour is silvery with the back from the muzzle to the tail of a steel blue, the line between that and the silvery sides well defined; the first six or seven dorsal rays are deeply tipped with black. Length nine inches.

Rockingham Bay (Mr. Ramsay's collection).

Genus KURTUS, Bl.

Body compressed, oblong, covered with exceedingly small scales; cleft of mouth wide, oblique, with the lower jaw prominent. Præoperculum denticulated. One dorsal fin with the spines rudimentary; anal with two spines; ventrals well developed, between them a horizontal backwards directed spine. Villiform teeth in the jaw, vomer and palatine bones. Seven branchiostegals; pseudobranchiæ none. Air-bladder present, enclosed by the ribs which are dilated, convex, forming rings with each other.

East Indian Seas.

325. KURTUS GULLIVERI, Casteln.

Proc. Linn. Soc. New South Wales, Vol. II., 233.

Norman River (fresh water).

DIVISION IV. ACANTH. POLYNEMIFORMES.

Two rather short dorsal fins, somewhat remote from each other; free filaments at the humeral arch below the pectoral fins; head with the muciferous system well developed. One family only.

FAMILY XII. POLYNEMIDÆ.

Characters of the Division.

Genus POLYNEMUS, L.

Two separate dorsal fins, the first with seven or eight spines, all feeble; the soft dorsal and anal nearly equal. Bands of villiform teeth in the jaws, on the vomer, the palatine and pterygoid bones. Præoperculum serrated. Scales moderate or rather small; pyloric appendages sometimes in immense number. Air-bladder of variable size and structure if present.

In most tropical seas. Entering rivers.

326. Polynemus indicus, Shaw.

Gunth. Cat. Fishes II., p. 326.

D. 8. 1/13-14. A. 2/11-12. L. lat. 65. L. transv. 7/13.

Five pectoral appendages, some reaching beyond the tip of the ventral fin; caudal lobes sometimes produced into filaments, the third dorsal spine filamentous. The distance beteen the root of the ventrals and the anal, longer than the head; a small prominent spine above the angle of the præoperculum.

Port Jackson (Gunther and Castelnau).

327. Polynemus macrochir, Gunth.

Ann. and Mag. Nat. Hist., 3rd series, Vol. XX., p. 60.

D. 8. 1/12. A. 2/12. L. lat. 70.

Five pectoral appendages, three of which extend to the anal fin; pectoral fin nearly as long as the head, the length of which is contained thrice and two-thirds in the length of the body, without the caudal fin, and is equal to the distance between the root of the ventral and the anal. A distinct spine above the angle of the præoperculum. Coloration uniform.

Port Jackson.

328. Polynemus cæcus, Macl.

Proc. Linn. Soc. N. S. Wales, Vol. II., p. 354, pl. 9, fig. 1.

Port Darwin. Length 18 inches.

Division V. ACANTH. SCIÆNIFORMES.

The soft dorsal fin is more, generally much more, developed than the spinous, or than the anal fin. No pectoral filaments; head with the muciferous system well developed.

FAMILY XIII. SCLÆNIDÆ.

Characters of the Division.

Genus SCLÆNA, Cuv.

Body oblong; eye of moderate size, the space between the eyes moderately broad and slightly convex; muzzle convex, with the upper jaw overlapping the lower or with the jaws equal, and with the cleft of the mouth horizontal or slightly oblique. The outer series of the jaws generally contains larger teeth, never large canines. No barbel; the second spine of the anal fin more or less indistinct. Pseudobranchiæ; air-bladder with appendages. Pyloric appendages in small number.

All seas. Entering fresh waters.

329. SCIÆNA ANTARCTICA, Casteln.

Proc. Zool. Soc., Victoria, Vol. I., p. 100.

? *Corvina Novæ Hollandiæ*, Steind., Sitzberg ak. Wiss. Wien, 1866, 53, p. 445, tab. 5, fig. 2.

The "*Jew Fish*" of Sydney, and "*King Fish*" of Melbourne Markets.

D. 9. 1/27. A. 2/7. P. 17. L. lat. 68.

This fish is said by Dr. Gunther and others to be identical with *S. aquila* of Europe. Count Castelnau, however, points out some important differences. In *S. antarctica* the maxillary does not reach the eye, and the eye itself is proportionally smaller than in *aquila*. The coloration also differs, in the Australian fish, the back is blue changing to green, the sides and lower parts of a dirty white, rather silvery; dorsal, anal, and ventral fins reddish, pectorals whitish with their extremity dark, some sinuosities or notches at the angle of the præoperculum.

Steindachner's species is probably the same, but I have never seen the description.

East and South Coasts of Australia.

Genus CORVINA, Cuv.

Scarcely differs from *Sciæna*, except in having the second anal spine very strong.

330. CORVINA ALBIDA, Cuv. & Val.

Gunth., Cat. Fishes II., p. 304.—Casteln., Proc. Linn. Soc., N. S. Wales, III., p. 47.

D. 10. 1/24-25. A. 2/7. L. lat. 75. L. transv. 7/19.

The height of the body is nearly equal to the length of the head and four times and a-half in the total length; the snout is rather obtuse, convex, with the jaws equal in front, shorter than the diameter of the eye, which is one-seventh of the length of the head; in both jaws an outer series of larger teeth. Præoperculum slightly denticulated, superscapula crenulated, coracoid entire. The ventral and pectoral fins equal; the caudal pointed. Coloration uniform, with an indistinct streak along the centre of each scale.

Norman River; a large fish.

Genus OTOLITHUS, Cuv.

Body oblong; muzzle obtuse or slightly pointed with the lower jaw longer. Two dorsal fins, the spines feeble, anal spines small. Conical canine teeth, more or less distinct, either in both jaws, or in the upper only. Præoperculum denticulate or crenulated. Scales moderate or small. Air-bladder with a horn-like process on each side directed forwards in some, in others with numerous lateral appendages. Pyloric appendages in small number.

Tropical seas entering rivers.

331. OTOLITHUS ATELODUS, Gunth.

Ann. and Mag. Nat. Hist 1867, 3rd series, Vol. XX., p. 60.

Otolithus teraglin, Macl., Proc. Linn. Soc. N.S. Wales, Vol. V. p. 48, I was not aware when I described this Fish under the specific name which it bears among fishermen, that Gunther had previously named it.

DIVISION VI. ACANTH. XIPHIIFORMES.

The upper jaw produced into a long cuneiform weapon.

FAMILY XIV. XIPHIIDÆ.

Body elongate, compressed, naked or covered with rudimentary dermal productions. Teeth none or rudimentary. Upper jaw sword shaped. One or two dorsal fins without a distinctly spinous portion. Ventrals absent or rudimentary and thoracic. Seven branchiostegals; pseudobranchiæ and air-bladder present; pyloric appendages in great number. Vertebræ 12-14/12.

Genus HISTIOPHORUS, Cuv. & Val.

Two dorsal and anal fins, the anterior one longest, and formed of spinous and soft rays. Ventrals reduced to a single or two or three spines. Scales none, sometimes rudimentary dermal productions. Small teeth in the jaw and on the palatine bones, none on the vomer.

Ocean Fishes.

332. HISTIOPHORUS GLADIUS, Brouss.

Gunth. Cat. Fishes II., p. 513.—Ramsay, Proc. Linn. Soc. N. S. Wales, Vol. V., p. 295, pl. 8.

Coast of New South Wales.

DIVISION VII. ACANTH. TRICHIURIFORMES.

Body elongate, compressed or band-like; cleft of mouth wide, with several strong teeth in the jaws or on the palate; the spinous and soft portions of the dorsal and anal fins are of nearly equal extent, long, many rayed, sometimes terminating in finlets; caudal fin forked, if present. One family only.

FAMILY XV. TRICHIURIDÆ.

Characters of Division.

Genus LEPIDOPUS, Gouan.

Body very elongate, band-like; cleft of mouth wide. One single dorsal fin along the whole back; caudal well developed; ventrals reduced to a pair of scales; anal spines numerous, but minute, or hidden beneath the skin. Scales none; several strong teeth in the jaws, teeth on the palatine bones; no keel on the tail. Eight branchiostegals. Air-bladder present; pyloric appendages in increased number.

All seas.

333. LEPIDOPUS CAUDATUS, White.

Gunth. Cat. Fishes II., p. 341.—Allp. Proc. Roy. Soc. Tas., 1875, p. 86.

"The *Scabbard Fish*" of English Fishermen.

D. 102-104. A. 24-25. Cœc. pylor. 23. Vert. 41/71.

The height of the body is fifteen times and a-half in the total length, caudal fin deeply forked. Anal spines in great number; minute if visible. Uniform silvery.

Tasmania.

Genus TRICHIURUS, L.

Body very elongate, band-like; tail tapering to a point; cleft of the mouth wide. One single dorsal fin along the whole back, caudal fin none; ventrals reduced to a pair of scales or entirely absent; anal spines numerous, but minute or hidden beneath the skin. Scales none. Strong teeth in the jaws, teeth on the palatine bones, none on the vomer. Seven branchiostegals. Air-bladder present; pyloric appendages in increased number.

Warm Seas of both hemispheres.

334. TRICHIURUS SAVALA, Cuv. & Val.

Gunth. Cat. Fishes II., p. 347.—Macl., Proc. Linn. Soc. N. S. Wales, Vol. II., p. 354.

D. 112-130.

The height of the body is thirteen to sixteen times in the total length, the length of the head six times and a-half to seven and a-quarter in the same ; the diameter of the eye is three times and a-half in the length of the snout, and equals the width of the interorbital space which is quite flat. The colour is uniform brilliant silvery white.

Port Darwin. (Macl. Mus.)

335. TRICHIURUS HAUMELA, Bl.

Gunth. Cat. Fishes II., p. 348.

D. 127-133.

The height of the body is fifteen to seventeen times in the total length, the length of the head is six to seven times in the same; the diameter of the eye is twice and a-fifth in the length of the snout. Silvery, back blackish.

Port Jackson, and Newcastle.

Genus THYRSITES, Cuv. & Val.

Body rather elongate; cleft of the mouth wide. The first dorsal fin continuous, with the spines of moderate strength, and extending on to the second. Two to six spurious fins behind the dorsal and anal. The greater portion of the body naked. Several strong teeth in the jaws; teeth on the palatine bones. No keel on the tail. Seven branchiostegals. Air-bladder present. Pyloric appendages in moderate number.

Pelagic Fishes of almost all seas.

336. THYRSITES ATUN, Cuv. & Val.

Gunth. Cat. Fishes II., p. 350.

The "*Barracoota.*"

D. 20. 1/10. vi. A. 1/10. vi. Vert. 37.

Ventral with one spine and five rays; the height of the body is contained eight times in the total length, the length of the head four times and a-half. The lateral line descends abruptly below the posterior part of the spinous dorsal. Coloration uniform.

Tasmania, Bass' Straits, South Coasts.

337. THYRSITES MICROPUS, M'Coy.

Ann. and Mag. Nat. Hist., 1873, 4th series, Vol. XI., p. 338.

"*The Tasmanian King Fish.*"

D. 17. 4/12. vi. A. 2/11. iv. V. 1/1. P.14. C. 22 4/4.

Height of body five times in total length to centre of caudal fin; head four times to end of lobes of the caudal; lower jaw longer than the upper; diameter of orbit one-fifth of the length of the head, and one half of the length of the muzzle; ventrals slightly in advance of base of pectorals, about a-third of the diameter of the eye in length, and with the ray bifurcate. Lateral line bifurcate, the upper branch extending from above the operculum, a little below the back, to the third finlet, the lower leaving the upper one under the fifth dorsal spine, descending with an abrupt curve nearly to the middle of the side, continuing nearly straight to opposite the middle of the anal fin, from which to the middle of the tail it describes three upward undulations. Colour brilliant lead-grey, whitish below; fins brownish. Surface of body smooth, with very minute scales imbedded in the skin. (M'Coy.)

Tasmania.

338. THYRSITES SOLANDRI, Cuv. & Val.

Gunth. Cat. Fishes II., p. 352.

D. 18. 1/8. II. A. 1/18. II.

The ventral is reduced to a single spine. The height of the body is five times and a-half in the total length. Coloration uniform.

Coast of New Holland (Cuv.)

DIVISION VIII. ACANTH. COTTOSCOMBRIFORMES.

Spines developed in one at least of the fins. Dorsal fins either continuous or close together; the spinous dorsal if present always short, sometimes modified into tentacles or into a suctorial disk; soft dorsal always long, if the spinous is absent; anal similarly developed as the soft dorsal, and both generally much longer than the spinous, sometimes terminating in finlets. Ventrals jugular or thoracic if present, never modified into an adhesive apparatus. No prominent anal papilla.

FAMILY XVI. ACRONURIDÆ.

One dorsal fin with several pungent spines anteriorly; one or more bony spines on each side of the tail; teeth compressed, truncated or lobate, closely set in a single series. Herbivorous Fishes.

Genus ACANTHURUS, Bl.

A single series of lobate incisors, which are sometimes moveable, in the jaws. A moveable spine in a groove on each side of the tail. Ventral fins composed of a spine and generally five rays. One dorsal fin, the spinous portion less developed than the soft; anal spines three. Scales minute, ctenoid, sometimes spiny. Branchiostegals five; pseudobranchiæ well developed; air-bladder large, forked posteriorly. Intestinal tract with several circumvolutions; five to seven pyloric appendages. Vertebræ 9/13.

Tropical seas.

339. ACANTHURUS TRIOSTEGUS, L.

Gunth. Cat. Fishes III., p. 327.

Teuthis australis, Gray, King's Survey Coasts of Aust. II., p. 435.

D. 9/23-25. A. 3/20. V. 1/5.

Height one half the length without caudal fin. Upper jaw with seven lobate incisors on each side; caudal spine small without posterior projecting process; the upper profile of snout concave. Caudal fin subtruncate. Reddish-violet, with five blackish brown transverse bands, the anterior of which passes through the orbit; another streak of the same colour along the median line of the snout; two brown spots one above the other on the end of the tail.

West Coast of Australia.

340. ACANTHURUS MATOIDES, Cuv. & Val.

Gunth. Cat. Fishes III., p. 330, and Ann. and Mag. Nat. Hist. 1867 Vol. XX., p. 60.

D. 9/27-28. A. 3/25-28. V. 1/5.

Height of body rather more than half the length without the caudal fin. The distance of the nostril from the edge of the upper jaw is two-thirds of the length of the head; the upper jaw with seven or eight lobate incisors on each side; caudal spine with a process posteriorly pointing backwards; upper profile of snout convex in adult specimens. Colour brown; the dorsal and anal fins with dark blue longitudinal streaks.

Nicol Bay (Gunther).

341. ACANTHURUS ANNULARIS, Cuv. & Val.

Casteln. Researches on the Fishes of Australia, p. 29.

Height of body half the length without the caudal fin; the distance from the edge of the upper jaw is less than two-thirds of the length of the head; teeth very strongly crenulated, caudal spine small, pointed forwards; the anterior profile is nearly straight; caudal fin very strongly emarginate. Black, with a bluish white band on the base of the tail, the upper and lower margins of the tail and the upper margin of the pectorals are of the same colour. Length six inches.

Cape York.

Dr. Gunther thinks this species is only the immature form of *A. matoides*. Count Castelnau regards them as quite distinct.

342. ACANTHURUS GRAMMOPTILUS, Richards.

Ann. and Mag. Nat. Hist. 1842, IX., p. 176.—Gunth., Cat. Fishes III., p. 335.

D. 9/20. A. 3/24.

Height of body two-sevenths of the length without the caudal fin; profile of snout rather convex; nine lobate teeth on each side of the upper jaw. Brown, with numerous undulated and irregular bluish longitudinal lines; a whitish band across the basal portion of the caudal fin, posterior half of the pectoral yellowish; dorsal fin with five dark longitudinal lines; anal with a light line along and within the margin; dorsal and anal fins with a black spot posteriorly.

Port Essington, Port Darwin.

Genus ACRONURUS, Cuv. & Val.

A single series of lobate incisors in the jaws. A moveable spine in a groove on each side of the tail. Scales none; skin with vertical striæ. Five branchiostegals.

Tropical Seas.

343. ACRONURUS FORMOSUS, Casteln.

Proc. Zoöl. Soc., Victoria, Vol. II., p. 104.

D. 9/30. A. 3/27.

Height of body three-fifths of the length without the caudal fin; head three times and a-third in the same; the eye twice and two-thirds in the head. The body is very compressed forming a broad oval; the anterior profile of the head convex, the crest over the orbit serrated; the lateral line is elevated, forming a ridge, sinuous and curved strongly downwards towards the end of the dorsal fin, to arch a little over the caudal spine. The tail is forked, the ventral fins have six rays. Colour reddish-brown, all anterior to the base of the pectorals of a golden colour, four series of large rounded black blotches on the back. From one to two inches in length.

Torres Straits (Castelnau).

Genus PRIONURUS, Lacep.

A single series of compressed denticulated incisors in each jaw. Tail with a series of several keeled, bony laminæ on each side. Scales minute. Branchiostegals five. Air-bladder large, forked posteriorly. Intestinal tract with several circumvolutions; pyloric appendages five.

Pacific Ocean.

344. PRIONURUS MICROLEPIDOTUS, Lacep.

Gunth. Cat. Fishes III., p. 347.

D. 8/22. A. 3/21. V. 1/5. Cæc. pylor. 5.

Snout moderately produced with the upper profile straight. A series of six laminæ on each side of the tail; a pair of small ones above and another below that series. Uniform brown or blackish-brown.

Port Jackson.

Genus NASEUS, Cuv. & Val.

A single series of slightly compressed incisors, sometimes denticulated, in the jaws. Tail with two (rarely one or three) bony plates, distinct and sharply keeled in adults, indistinct or absent in young specimens. Head sometimes with a horn or crest-like prominence. Ventrals 1/3. Dorsal spines four to six; anal two. Scales minute, rough like shagreen.

Indian and Polynesian Seas.

345. NASEUS UNICORNIS, Forsk.

Gunth. Cat. Fishes III., p. 348.

D. 5-6/31-28. A. 2/26-27. Cæc. pylor. 7-8. Vert. 9/12.

Forehead produced in a horn-like protuberance, longer or shorter according to age, horizontal, and on a level with the upper part of the orbit. Snout produced beyond the tip of the horn; the length of its upper profile, taken from the base of horn, is more than twice the distance of the orbit from the first dorsal spine. Teeth lightly compressed, tapering, not serrated. Height of body two-fifths of the length without caudal fin. Two spiniferous plates on each side of the tail. Brownish grey; dorsal and anal fins with longitudinal blue stripes.

Torres Straits (Chevert Exp.)

346. NASEUS ANNULATUS, Quoy & Gaim.

Gunth. Cat. Fishes III., p. 352.—All. and Macl., Proc. Linn. Soc. New South Wales, Vol. I., p. 340.

D. 5-6/28-29. A. 2/28-29. Cæc. pylor. 5.

Forehead with a projecting protuberance, situated below the level of the centre of the orbits. Snout moderately produced; teeth very small, with a very fine serrature on the apical half; caudal plates very small, scarcely keeled. Brown; anal fin with one or two bluish longitudinal bands, dorsal and anal with a narrow, and caudal with a rather broad, white edge. Young specimens have a white ring round the tail.

Cape Grenville (Chevert Exp.)

FAMILY XVII. CARANGIDÆ.

Body generally compressed, oblong, or elevated, covered with small scales or naked. Dentition variable. The spinous portion of the dorsal fin sometimes rudimentary, the soft dorsal and anal of about equal size. Ventrals thoracic sometimes rudimentary. Vertebræ 10/14.

Genus TRACHURUS, Cuv. & Val.

Body oblong, slightly compressed, covered with very small scales; the lateral line with a band of high plates from beginning to end. Snout extended. Two dorsal fins with a horizontal anterior spine; anal with two spines, separate from the soft portion. No finlets. Teeth minute in the jaws and on the vomer and palatine bones. Seven branchiostegals; pseudobranchiæ; air-bladder bifurcate posteriorly. Pyloric appendages in small number.

All Seas.

347. TRACHURUS TRACHURUS, Cuv. & Val.

Gunth. Cat. Fishes II., p. 419.

Caranx declivis, Jenyns., Zool. Beagle Fishes, p. 68, pl. 14.

Horse Mackerel of England; the *Yellow Tail* of Sydney.

D. 8. 1/33. A. 2. 1/29. L. lat. 75.

The height of the body is about one-fifth of the total length, the length of the head a little less; the snout is longer than the diameter of the eye, the maxillary reaches to, or slightly beyond the vertical from the anterior margin of the eye; the lateral line becomes straight and strongly armed beneath the eighth dorsal ray. A black blotch on the posterior margin of the operculum; tail yellow.

Coasts of New South Wales, Victoria, and Tasmania.

Genus CARANX, Cuv. & Val.

Body more or less compressed; mouth moderate. The first dorsal fin continuous with feeble or rudimentary spines, a spine directed forwards in front; two anal spines separated from the soft portion. Scales very small, lateral line with an anterior curved and a posterior straight portion, the latter with strongly armed or keeled scales. Dentition feeble. Seven branchiostegals; air-bladder simple, bifurcate posteriorly; pyloric appendages in great number.

Almost all temperate and tropical seas.

348. CARANX NOBILIS, *n. sp.*

D. 7. 1/25. A. 2/23.

The height of the body is from three and a-half to four times in the total length, the length of the head is a little less than the height of the body; the profile is slightly convex above the eye and slightly concave above the snout. The maxillary bone does not nearly reach the vertical from the eye, and its upper posterior angle fits into a notch in the præorbital bone. Teeth very small, an outer series of small molar-like ones in the upper jaw; none on the palate. Eye moderate, about equidistant from the snout and the extremity of the operculum, and about four diameters apart. Breast scaly. The lateral line slightly bent, the keeled plates commencing close to the tail. The pectoral fin reaches to the sixth anal ray. The soft dorsal and anal fins are low and can be completely received into a skinny sheath, the last ray of each is longer than the others and semi-detached; the caudal fin is forked, the lobes long, spreading, and pointed. The general colour is a silvery-yellow, with a bluish tint on the back. The opercular spot apparently wanting; the fins are yellow, excepting the caudal which is blackish on the outside. Length 24 inches.

Port Jackson.

349. CARANX MALABARICUS, Bl.

Gunth. Cat. Fishes II., p. 436.

D. 8. 1/21-22. A. 2. 1/17. L. lat. 25-30.

Teeth in the jaws, minute, villiform, arranged in bands; teeth on the vomer, palatine bones, and tongue. Height of body twice and a-quarter to twice and three quarters in the total length. the length of the head three and two-thirds to four-times. Snout obtuse, rather longer than the diameter of the eye; lower jaw longer than the upper: the maxillary bone reaches to or slightly beyond the vertical from the anterior margin of the eye; the præorbital above the angle of the mouth not so high as the orbit. Breast naked, the lateral line moderately bent, becoming straight behind the middle of the second dorsal; the plates little developed. Fins pointed without filiform ray. Opercular spot brown; the dorsal and anal fins with a brown margin, ventrals and anal whitish.

Australia, (Macgillivray's collection.)

350. CARANX GEORGIANUS, Cuv. & Val.

Gunth. Cat. Fishes II., p. 440.—Richards, Fishes Ereb. & Terr., p. 135, pl. 58, fig. 1-3.

"*White Trevally*" of the Sydney Fishermen.

D. 8. 1/26-29. A. 2/1/22-24. L. lat. 20-25.

Teeth small in the jaws and on the vomer, palatine bones and tongue. Height of body three and a-third to three and three-quarter times in the total length, the length of the head four to four and a-half. Upper jaw a little the longer; the maxillary does not quite reach the vertical from the anterior margin of the orbit. Breast scaly; the lateral line follows the curvature of the back and becomes straight below the middle of the soft dorsal; the plates little developed. Opercular spot and top of spinous dorsal black.

All Australian Seas.

351. Caranx leptolepis, Cuv. & Val.

Gunth. Cat. Fishes II., p. 440.

D. 8. 1/24-26. A. 2. 1/20-23. L. lat. 25-30.

Teeth of tongue and lower jaw minute, none in the upper jaw, or on the vomer and palatine bones. The height of the body is nearly four times in the total length, the length of the head nearly four and a-half. The jaws are equal, and the maxillary just reaches the vertical from the anterior margin of the eye. Breast-scaly; the lateral line moderately bent and becoming straight under the middle of the soft dorsal, the plates little developed and scarcely armed.

Australia, (Macgillivray's collection).

352. Caranx Cheverti, All. & Macl.

Proc. Linn. Soc. N. S. Wales, Vol I., p. 324, pl. 10, f. 1.

Katow, South Coast of New Guinea.

353. Caranx laticaudis, All. & Macl.

Proc. Linn. Soc. N. S. Wales, Vol. I., p. 325, pl. 10, fig. 2.

Hall Sound, South Coast New Guinea.

354. Caranx Papuensis, All. & Macl.

Proc. Linn. Soc. N.S. Wales, Vol. I., p. 325, pl. 10. fig. 3.

Hall Sound, South Coast New Guinea.

355. Caranx bucculentus, All. & Macl.

Proc. Linn. Soc. N.S. Wales, Vol. I., p. 326, pl. 11, fig. 1.

Cape Grenville.

356. Caranx edentulus, All. & Macl.

Proc. Linn. Soc. N.S. Wales, Vol. I., p. 327, pl. 11, fig. 2.

Percy Islands.

357. CARANX SPECIOSUS, Forsk.

Gunth., Cat. Fishes II., p. 444.

Caranx pooloosoo, Rickards, Voy. Ereb. and Terr., pl. 58, f. 4—5.

D. 7. 1/18-20. A. 2. 1/15-16. L. lat. 15.

Teeth none or imperceptible; height of body one-third of total length; the length of the head one-fourth; breast scaly; the lateral line is bent and becomes straight below the anterior third of the soft dorsal; the plates are small. The lower jaw shorter than the upper, the maxillary reaches the vertical from the anterior margin of the eye. Silvery, with six brown vertical bars, with six narrower stripes between; the first bar through the eye. Adult specimens uniform.

Torres Straits. (Small specimens Chevert Exp.)

358. CARANX HIPPOS, L.

Gunth. Cat. Fishes II., p. 449.

Caranx paraspistes, Richards, Voy. Ereb. and Terr., Ichth., p. 136, pl. 58, f. 6-7.

D. 7-8. 1/19-22. A. 2, 1/16-17. L. lat. 30-36.

Teeth of upper jaw in a villiform band with an outer series of stronger teeth, lower jaw with a single series of small teeth, intermixed with larger. Height of body three-times and a-fifth in the total length; the length of the head four times, and the length of the pectoral fin three and three-quarters. Breast scaly, the lateral line strongly bent, the straight portion begins abruptly below the third dorsal ray and the plates are strongly developed. The lower jaw is longer than the upper and the maxillary extends to below the centre of the eye. Opercular spot none, or indistinct; top of the second dorsal fin blackish.

All the Coasts and Seas of Australia.

359. Caranx valenciennei, Casteln.

Proc. Zool. Soc., Victoria, Vol. II., p. 102.

D. 8. 1/23. A. 2. 1/20.

Præoperculum very lightly serrated; a series of villiform teeth in the jaws, with an outer series of larger teeth; teeth on the palate. Height of body twice and two-thirds in total length; length of head three times and two-thirds in the same; the orbit three times and three-fourths in the length of the head; the snout is longer than the diameter of the eye; the lower jaw is longer than the upper; the maxillary does not nearly reach the vertical from the anterior margin of the eye. The straight portion of the lateral line is nearly half the length of the curved, is strongly armed, and consists of forty six shields. Colour gilt, with the upper part light blue; fins yellow; no opercular spot; a short oblique ridge on each side of the tail.

Knob Island, Torres Straits.

360. Caranx Gervaisi, Casteln.

Researches on the Fishes of Australia, p. 18.

Height of body one-fourth of the total length; head contained three times and a-half in the same; diameter of eye a little over three times in the length of the head; teeth small, equal in both jaws; a longitudinal keel strongly denticulated on the palate; body elongate; lower jaw longer than upper; lateral line strongly arched under the first dorsal fin, the straight part formed of very broad plates, nearly one-third the height of the body, and keeled. Colour silvery, becoming slate-colour on the back; opercular spot visible; fins hyaline; the caudal bordered with black. Length six inches.

Cape York, (Castelnau).

361. Caranx armatus, Cuv. and Val.

Gunth. Cat. Fishes II., p. 453.

D. 7-8. 1/20-21. A. 2. 1/16-17. L. lat. 20.

Bands of villiform teeth in the jaws, teeth on the vomer, palatines and tongue. The first ray of the dorsal and anal fins, and in males generally some of the middle ones, exceedingly elongate and filiform. Height of body half the length. Snout obtuse, equal to the diameter of the eye; lower jaw longest; the maxillary reaches beyond the vertical from the anterior margin of the orbit. Breast naked; lateral line moderately bent, becoming straight below the posterior half of the soft dorsal, the plates little developed. Opercular spot brown, the body banded in young specimens; the first ray of the dorsal and anal fins generally black, ventrals blackish.

Cape York (Chevert Exp.)

362. CARANX RADIATUS, *n. sp.*

D. 6. 1/23. A. 2. 1/19.

Small teeth in the jaws and on the vomer and palate. An outer series of rather larger teeth in the jaws; body compressed, the height about one-third of the length; snout more than the diameter of the eye; the maxillary reaching to the vertical from near the middle of the eye. Scales small, adherent, covering the whole body; lateral line much curved on the first third, the straight portion commencing below the commencement of the second dorsal, strongly keeled and occupying forty-one scales. All the rays of the dorsal and anal fins prolonged into filaments, with a very large skinny sheath for their reception; tail small, spreading, and deeply forked; pectorals extending to about the tenth plate of the straight portion of the lateral line. Colour, (spirit specimen) brownish-silvery.

Rockingham Bay (Ramsay's Coll.)

363. CARANX CILIARIS, Bl.

Gunth. Cat. Fishes II., p. 454.—Jour. Mus. Godeff. Heft. V., t. 89.

D. 6. 1/19. A. 2. 1/10. L. lat. 15.

Teeth in villiform bands in the jaws, teeth on the vomer, palatines and tongue; height of body once and a-half in the total length, the length of head three times and a-half; the first dorsal fin short and rudimentary, the anterior rays of the second dorsal and anal exceedingly elongate and filiform; lower jaw longer than upper; the maxillary extends beyond the vertical from the anterior margin of the eye. The width of the opercle is half its height; the lateral line is bent anteriorly, and becomes straight below the middle of the soft dorsal, the plates very little developed. Opercular spot and membrane between the first five dorsal rays black. Body with six subvertical blackish bands, disappearing with age.

Port Jackson. North Coast.

364. CARANX GALLUS, L.

Gunth., Cat. Fishes II., p. 455.

Gallichthys major, Cuv. & Val., Hist. Poiss. IX., p. 168, pl. 254.

B. 6. D. - 1/19. A. - 1/16. L. lat. 8. Vert. 10/14.

Spines of dorsal and anal entirely absent; the ventrals and the anterior rays of the soft dorsal and anal fins very elongate, filiform. Teeth as in *C. ciliaris*. Height of body about twice in the total length; the height of the præorbital much more than the diameter of the eye. The origin of the soft dorsal is the highest point of the back, from which the profile descends rapidly and is convex on the nape of the neck. Lower jaw prominent; lateral line strongly curved anteriorly, becoming straight below the middle of the dorsal, the plates very little developed. Scales none. Uniform silvery, immature specimens with vertical bands.

Endeavour River (Macl. Mus.)

Genus SERIOLA, Cuv.

Characters the same as *Caranx*, but with the body less compressed and the lateral line not armed.

Nearly all temperate and tropical seas.

365. SERIOLA LALANDII, Cuv. & Val.

Gunth. Cat. Fishes II., p. 463.

" *King Fish* " of Port Jackson.

D. 7. 1/32-34. A. 2. 1/20-21.

Scales very small; height of body about four times and a-half in the total length, head about the same; snout elongate, twice the diameter of the eye in length. Abdomen broad, not compressed; ventral fins moderate, their length twice and a-half in the distance beteen their base and that of the anal fin; the maxillary reaches somewhat beyond the vertical from the anterior margin of the eye. Coloration uniform.

Port Jackson. East Coast.

366. SERIOLA NIGROFASCIATA, Rüpp.

Gunth. Cat. Fishes II., p. 465.

B. 7. D. 5-6 1/31-33. A. - 1/15-17. Cœc. pylor. 7.

Scales exceedingly small, rudimentary. The height of the body is three times and two-thirds in the total length, the length of the head four times; snout obtuse, equal in length to, or rather shorter than, the diameter of the eye. Abdomen broad, not compressed; the ventral fins nearly as long as the head; the maxillary reaches to the vertical from the centre of the eye. Back crossed by six broad brown bands; the ventrals and top of the dorsal and anal fins black.

Port Jackson (Castelnau.)

367. Seriola gigas, Gunth.

Gunth. Cat. Fishes II., p. 446.

D. 8. 1/24. A. 2. 1/16.

Scales small; height of body four times and four-fifths in the total length, and equal to the length of the head; the snout is of moderate extent, twice the diameter of the eye and subconical. The maxillary reaches to the vertical from the anterior margin of the orbit; the ventrals are longer than the pectoral fins, but do not reach the vent. The teeth form broad villiform bands; the band on the vomer is elongate and quadrangular, that on the palatines broad and elliptical. The soft dorsal and anal fins are elevated anteriorly, their height being more than half that of the body. Coloration uniform, the sides sometimes dotted with brown.

Houtman's Abrolhos, West Australia.

368. Seriola grandis, Casteln.

Proc. Zool. Soc., Victoria, Vol. I., p. 115.

"*Yellow Tail*" of the Melbourne Fishermen.

D. 6. 1/35. A. - 1/20.

Of long oval form, height of body four times in the total length, the length of the head about four times and one-third; and the orbit seven times and one-third in the length of the head. Eye oval and oblique; lateral line wavy and marked on about 143 scales, the transverse line contains nearly 200; a keel on the posterior part of the lateral line near the tail. Scales on the posterior parts of the body larger; dorsal spines very low; second dorsal and anal fins have their anterior rays much longer than the others, giving a falciform appearance. Coloration dark blue above, silvery grey below; a yellow longitudinal band on each side; fins yellowish-grey; caudal yellow, darker in the centre; pectorals black with yellow edge; mouth flesh colour; eye yellow.

Melbourne; Port Jackson (Castelnau).

369. SERIOLA HIPPOS, Gunth.

Ann. and Mag. Nat. Hist. 1876, 4th series, Vol. XVII., p. 392.

"*Samson Fish*" of Sydney Fishermen.

D. 7/25. A. 2/17.

Scales minute, height of body twice and one-third in the length (without caudal), the length of the head thrice and one-third; snout short and high; upper profile of the head parabolic, (resembling *Caranx hippos*,). Jaws equal, the maxillary extends to below the middle of the eye; its extremity dilated, as broad as the præorbital. Eye far below the upper profile of the head; angle of præoperculum rounded; the fifth dorsal spine longest, as long as the eye; anterior rays of soft dorsal and anal fins somewhat higher than the others. Caudal deeply forked; pectorals broad, short, shorter than the ventrals. Silvery, back greenish. The upper half of the body with five rather broad black cross bands; one in front, one below the spinous dorsal, and three below the soft dorsal; (these become indistinct in old specimens); a similar but less distinct band above the eye; spinous dorsal and ventral fins black.

Port Jackson.

Genus NEPTOMENUS, Gunth.

Body oblong, compressed, covered with cycloid scales of moderate size; the cleft of the mouth of moderate width; snout obtusely conical. Præopercular margin obtusely crenulated. The first dorsal fin continuous with seven feeble spines, the second and anal more developed, with a scaly sheath at the base; finlets none; anal spines indistinct. Pectoral fins much longer than the ventrals. A series of minute teeth in the jaws; palate toothless. Six branchiostegals.

New Zealand and Australian Seas.

370. Neptomenus brama, Gunth.

Gunth. Cat. Fishes II., p. 390.

D. 7. 1/27. A. 2/21. L. lat. 88. L. transv. 16/25.

Height of body three times and a-half in the total length; length of head four and a-half in the same; snout obtusely conical, equal in length to the diameter of the eye; the maxillary feeble, extending to the vertical from the anterior margin of the eye; posterior edge of præoperculum emarginate, the angle rounded. Dorsal spines feeble, anal indistinct, soft dorsal and anal fins rather low, with a scaly sheath at the base; pectorals elongate and pointed, ventrals rather short, attached to the belly by a membrane; caudal deeply forked. Colour greenish-silvery, with narrow shining longitudinal streaks along the series of scales.

Tasmania.

371. Neptomenus dobula, Gunth.

Gunth., Proc. Zool. Soc., Lond., 1869, p. 429.

D. 7. 1/40, A. 2. 1/23. Vert. 24.

The length of the head is three times and a-half in the total length, (without caudal fin), the height of the body four times and one-third. Scales small and deciduous. Pectoral fin not quite so long as the head.

Tasmania.

372. Neptomenus travale, Casteln.

Proc. Zool. Soc., Victoria, Vol. I., p. 119.

D. 6. 2/30. A. 2. 2/21. L. lat. 93.

Height twice and two-thirds in the total length; head four times. Snout short; eye large; lower jaw longer than upper, upper part of head naked; cheeks and operculum scaly; præoperculum emarginate behind and very finely denticulated and rayed. Scales small and deciduous; tail forked. General colour bluish-grey, lighter on the belly, a broad purplish spot on the back behind the head; sides sometimes covered with minute dark dots.

Melbourne. Port Jackson? (Macl. Mus.)

Genus CHORINEMUS, Cuv. & Val.

Body compressed, oblong; cleft of mouth moderate or wide, dermal productions small, lanceolate, hidden in the skin. Two dorsal fins, the first formed by free spines in small number; the posterior rays of the second dorsal and of the anal, detached or semi-detached, penicillated. Two anal spines separated from the soft portion. Small teeth in the jaws, and on the vomer and palatines. Branchiostegals seven or eight. Pseudobranchiæ. Air-bladder bifurcate posteriorly; pyloric appendages in great number.

In most tropical seas.

373. CHORINEMUS LYSAN, Forsk.

Gunth. Cat. Fishes, II., p. 471.

Chorinemus Forsteri, Richards, Ann. and Mag. Nat. Hist, 1843, XI., p. 24.

B. 8. D. 7. 1/19. A. 2. 1/18. Vert. 10/16.

Height of body four times in the total length, the length of the head five and a-half times. The maxillary is very slightly widened and rounded posteriorly and reaches far beyond the vertical from the posterior margin of the eye; the length of the intermaxillary is more than half that of the head; the snout is obtuse, and about equal in length to the diameter of the eye. A series of six or eight large, round, brown spots above the lateral line.

Cape York. Torres Straits. (Chevert Exp.)

374. CHORINEMUS TOLOO, Cuv. & Val.

Gunth. Cat. Fishes II., p. 473.

D. 7. 1/19. A. 2. 1/18.

The height of the body is four times and the length of the head five times and a-half in the total length. The maxillary does not reach to the vertical from the posterior margin of the eye. The snout is obtuse and about as long as the diameter of the eye. A series of more or less distinct greyish spots along the side of the body; the top of the dorsal and anal fins and the lobes of the caudal blackish.

Cape York (Chevert Exp.) South Australia (Castelnau).

Genus TEMNODON, Cuv. & Val.

Body oblong, compressed, covered with cycloid scales of moderate size; cleft of mouth rather wide. Jaws with a series of strong teeth; teeth on the vomer and palatine bones. Præoperculum with some slight denticulations; the first dorsal fin with eight feeble spines, continuous; the second and anal more developed, covered with scales and without finlets. Branchiostegals seven; air-bladder simple; pyloric appendages in great number.

Nearly all temperate and tropical seas.

375. TEMNODON SALTATOR, Bl.

Gunth., Cat. Fishes II., p. 479.

" *Tailor* " of Sydney; " *Skip Jack* " of Melbourne.

D. 8. 1/24-26. A. 1-2. 1/26-28. L. lat. 90-100. L. transv. 8/19. Vert. 12/14.

The maxillary reaches to or nearly to, the vertical from the posterior margin of the eye. Præoperculum with a notch above the angle and slight denticulations along the lower limb. Dorsal spines very feeble. Coloration uniform.

Port Jackson. All Australian Coasts.

Genus TRACHYNOTUS, Cuv. & Val.

Body compressed, more or less elevated, covered with very small scales; cleft of mouth small, muzzle swollen above, obtuse. Opercles entire. Two dorsal fins, the first composed of free spines in small number, with an anterior horizontal one; two anal spines separated from the soft portion. No finlets. Small teeth in the jaws and on the vomer and palatines, disappearing with age. Seven branchiostegals, no pseudobranchiæ. Pyloric appendages in considerable or moderate number.

Nearly all temperate and tropical seas.

376. TRACHYNOTUS OVATUS, L.

Gunth., Cat. Fishes II., p. 481. Many synonyms.

D. 6. 1/18-21. A. 2. 1/16-19.

Height of body from two to two and one-third times in the total length, length of head five and a-quarter, and lobe of caudal fin four times. Anterior rays of dorsal and anal fins more or less produced. Coloration uniform, dorsal, anal, and caudal lobes black.

Port Jackson. All Australian Coasts.

377. TRACHYNOTUS BAILLONII, Cuv. & Val.

Gunth., Cat. Fishes II., p. 484.

D. 6. 1/22. A. 2. 1/22.

The height of the body is three times and two-thirds in the total length, the length of the head five times, and a lobe of the tail three and a-third times. The anterior rays of the dorsal reach beyond the middle of the fin, those of the anal, beyond the end of the fin. A series of three or five black dots along the lateral line, which is nearly straight. Dorsal, caudal, and anal lobes black.

Port Jackson. Torres Straits (Chevert Exp.)

Genus Psettus, Cuv. & Val.

Body much compressed and elevated, snout rather short. One dorsal fin entirely covered with scales, with seven or eight spines; anal with three; ventrals rudimentary. Teeth villiform, none on the palate. Scales small. Six branchiostegals; air-bladder forked behind, pyloric appendages in increased number.

Indian and Polynesian Seas.

378. Psettus argenteus, L.

Richards, Voy. Ereb. and Terror, p. 57, pl. 35.—Gunth., Cat. Fishes II., p. 487.

D. 8/29. A. 3/29. L. lat. 75. Vert. 9/14.

The height of the body is once and a-half in its length (without fins); the diameter of the eye is nearly one-third of the length of the head. Silvery; a blackish ocular band, indistinct in mature specimens.

Port Jackson. All Australian Coasts.

Genus Platax, Cuv. & Val.

Body much compressed and elevated; snout very short. One dorsal fin, with the spinous portion nearly entirely hidden and generally formed of five spines; anal with three; ventrals well developed with one spine and five rays. Teeth setiform, with an external series of rather larger ones, notched at the top; no teeth on the palate. Scales moderate or small. Six branchiostegals; air-bladder simple.

Indian and Australian Seas.

379. Platax vespertilio, Bl.

Gunth., Cat. Fishes II., p. 489.—Bleek., Atl. Ichth. Chætod., pl. 18, fig. 2-3, and pl. 17, fig. 1.

D. 5/35-37. A. 3/26-28. L. lat. 64.

The height of the body is greater than the length (caudal fin excluded); snout entirely obtuse, not prominent; dorsal and anal fins elevated; the ventrals extending nearly to the middle of the anal fin. Ventrals black; a brown ocular band reticulated with black.

Cardwell, Queensland (Castelnau).

380. PLATAX ORBICULARIS, Forsk.

Gunth. Cat. Fishes II., p. 490.—Macl. Proc. Linn. Soc. N.S W., II., p. 353.

D. 3-5/36-37. A. 3/26-27. L. lat. 55-60.

Height of body less than its length, (without caudal); snout prominent; præorbital a little narrower than the orbit; dorsal and anal fins moderately elevated, rounded; ventrals not reaching the anal fin, black at the base and the extremity. A more or less distinct ocular band.

Port Darwin (Macl. Mus.)

381. PLATAX TEIRA, Forsk.

Gunth. Cat. Fishes II., p. 492.—Bleek., Atl. Ichth. Chætod., pl. 17, fig. 2.

D. 5/31-33. A. 3/24-27.

Scales very small; height of body more than its length (without fins); snout entirely obtuse, not prominent. Dorsal and anal fins exceedingly elevated in immature specimens, obtuse in adult ones; the ventral fins reach beyond the caudal, in adult specimens scarcely to the anal. Ventrals black; three blackish vertical bands; one through the eye, one over the shoulder to the belly, and one from the dorsal to the anal; these bands disappear with age.

Hall Sound, South Coast of New Guinea (Chevert Exp.)

Genus Zanclus, Cuv. & Val.

Body much compressed and elevated; one dorsal fin with seven spines, the third very elongate. No teeth on the palate; præoperculum without spine. Scales minute, rough. Air-bladder present. Branchiostegals four. Pyloric appendages in increased number.

Indian and Polynesian Seas.

382. Zanclus cornutus, L.

Gunth. Cat. Fishes II., p. 493.—Bleek., Atl. Ichth. Chætod., pl. 4, fig. 1-2.

B. 4. D. 7/41. A. 4/32. Cæc. pylor. 14. Vert. 9/13.

A pointed horn above each orbit in adult specimens; the third dorsal spine exceedingly elongate, filiform. Two broad black cross-bands from the dorsal fin to the belly; caudal fin black, with the posterior margin white, crescent shaped.

Australia ? (old collection).

Genus Psenes, Cuv. & Val.

Body compressed, elevated, covered with rather small cycloid scales; cleft of the mouth narrow, with the muzzle above swollen, truncated and short. Two dorsal fins, the first continuous, the second and anal more developed; anal spines joined to the soft portion. A series of small teeth in the jaws, none on the palate. Six or seven branchiostegals; air bladder bifurcate posteriorly.

Indian and Australian Seas.

383. Psenes leucurus, Jenyns.

Zool. Beagle, Fishes p. 73.—Gunth., Cat. Fishes II., p. 495.

D. 10. 1/27. A. 3/27.

The height of the body is two and a-half times in the total length. Fins black or dusky; caudal whitish. From one to two inches in length.

Port Jackson (Gunther).

Genus EQUULA, Cuv. & Val.

Body more or less compressed, elevated or oblong, covered with small deciduous cycloid scales. Mouth very protractile. Minute teeth in the jaws, none on the palate. One dorsal fin. Five branchiostegals; pseudobranchiæ; air-bladder large, terminating in two short horns.

Indian and Australian Seas.

384. EQUULA EDENTULA, Bl.

Gunth. Cat. Fishes II., p. 498.

Equula serrulifera, Richards, Voy. Erebus and Terror, Ichth., p. 137, pl. 59, fig. 12-14.

B. 5. D. 8/15-16. A. 3/14. Cæc. pylor. 2.

Height of body twice or twice and a-quarter in the total length, the length of the head from four times to four and a-third; the upper profile is angular. A pair of small spines above the anterior margin of the orbit; the cavity on the head is quadrangular, much broader anteriorly than posteriorly, its width between the spines being once and two-thirds in its length. The lower præopercular margin is serrated, and its length is one and two-fifths that of the mandibula, which is very concave and ascends at an angle of about 45°. The second dorsal spine is three quarters the length of the head. Scales very small, but conspicuous. Spinous dorsal without black; base of the pectoral brownish.

Coasts of Australia (Richardson); Endeavour River (Macl. Museum).

385. Equula interrupta, Cuv. & Val.

Gunth., Cat. Fishes II., p. 504.

D. 8/16. A. 3/14.

The height of the body is one-half the total length, the length of the head is contained four times and two-thirds in the same. No spines above the orbit; the cavity on the head is triangular, and twice and a-half as long as broad. The lower præopercular margin is minutely serrated; the mandibula ascends in a vertical line. Scales rather small; the lateral line terminates below the origin of the soft dorsal. Back with somewhat irregular vertical blackish streaks. generally interrupted and forming spots.

Port Essington.

FAMILY XVIII., CYTTIDÆ.

Scombroid fishes with two distinct divisions of the dorsal fin, the spinous portion less developed than the soft. Body elevated, covered with very small or rudimentary scales or bony protuberances.

Genus Zeus, Cuv.

Body much compressed and elevated; cleft of mouth wide. Scales exceedingly small or entirely absent. Two contiguous dorsal fins, the first with nine or ten spines; the anal with three or four spines; a series of bony plates along the base of the dorsal and anal fins; another series on the abdomen. Minute teeth in the jaws and on the vomer; none on the palatine bones. Seven branchiostegals. Air-bladder large; pyloric appendages in very great number.

Mediterranean, Atlantic and Pacific Oceans.

386. Zeus australis, Richards.

Zool. Voy. Erebus and Terror, pp. 36 and 138, pl. 25, f. 1.—Casteln., Proc. Zool. Soc., Victoria, Vol. I. p. 108.

"*John Dorey.*"

D. 10/23. A. 4/22. V. 1/6.

Height of body two and a-half times in the total length, head three times in the same; orbit five times in the length of the head. A short pointed backwards spine at the root of each dorsal spine. At the base of the soft dorsal and anal fins there are about seven bony plates armed with one or two spines on each; nine spinous plates between the ventrals and the anus. General colour dark green, with yellow tinges on the sides of the head and body. A large round black blotch about the middle of the side.

Port Jackson. Port Phillip.

Dr. Gunther regards this species as identical with the John Dorey of Europe, *Zeus faber*.

Genus CYTTUS, Gunth.

Body compressed and elevated, covered with very small scales; mouth protractile. Two contiguous dorsal fins, the first with eight or nine spines, the anal with two. No bony plates along the base of the dorsal and anal fins. Ventrals with one spine and six or eight soft rays. Minute teeth in jaws and on vomer, none on the palatines. Eight branchiostegals.

Madeira and Australia.

387. CYTTUS AUSTRALIS, Richards.

Gunth., Cat. Fishes II., p. 396.

Capros australis, Richards, Voy. Erebus and Terror, Ichth., p. 137, pl. 59, f. 1-5.

B. 8. D. 9/28. A. 2/30. V. 1/6.

The upper and lower profiles of the snout are straight. Scales very small. The spines of the dorsal and ventral fins elongate and flexible, those of the anal short. The ventrals can be received in a sheath on the abdomen, and cover the vent. Silvery.

Tasmania, South Coasts of Australia.

FAMILY XIX. CORYPHÆNIDÆ.

Scombroid fishes with one long dorsal fin, without distinct spinous division, and without teeth in the œsophagus.

Genus CORYPHÆNA, Cuv. & Val.

Body compressed, rather elongate; adults with an elevated crest on the skull; cleft of the mouth wide. A single dorsal fin, extending from the occiput nearly to the caudal fin, which is deeply forked; no distinct dorsal and anal spines; the ventral fins are well developed and can be received partly in a groove in the abdomen. Scales very small. Cardiform teeth in the jaws, on the vomer and the palatine bones; a patch of villiform teeth on the tongue. Branchiostegals seven; pseudobranchiæ and air-bladder absent. Pyloric appendages exceedingly numerous.

Pelagic Fishes.

388. CORYPHÆNA PUNCTULATA, Cuv. & Val.

Gunth., Cat. Fishes II., p. 408.

D. 51. A. 25.

The height of the body is nearly equal to the length of the head, and one-fourth of the length of the body without the caudal fin. The ten or twelve posterior rays of the dorsal and anal fins have their extremities dilated and projecting beyond the membrane, by which they are connected at the base. Silvery, darker on the back, with scattered black dots. (Cuv.)

Port Jackson.

One specimen in the Australian Museum, perhaps not *C. punctulata*, but seems to resemble that species most.

Genus BRAMA, Risso.

Body compressed and more or less elevated, covered with rather small scales; cleft of the mouth very oblique, with the lower jaw longest. Dorsal and anal fins elongate, the former with three or four, the latter with two or three spines; caudal deeply forked; ventrals thoracic, with one spine and five rays. The jaws with an outer series of stronger teeth, the teeth of the palatine bones and of the vomer are easily lost. Opercles entire. Seven branchiostegals; air-bladder none. Pyloric appendages in small number.

Almost all seas.

389. Brama Raii, Bl.

Gunth., Cat. Fishes II., p. 408.—Cuv. & Val., pl. 190.

D. 3/30-33. A. 2/27. L. lat. 80-95. L. transv. 13/23. Cæc. pylor. 5. Vert. 16/26.

The greatest height of the body is below the origin of the dorsal fin, and is one-third of the total length; the eye is situated in the centre of the head; the pectoral fins reach to the middle of the anal fin. Coloration uniform.

Port Jackson (Castlenau.)

Family XX. NOMEIDÆ.

Scombroid fishes with two dorsal fins, sometimes finlets; caudal fin forked. Scales cycloid, of moderate size; body oblong.

Genus Nomeus, Cuv. & Val.

Body oblong, rather compressed, covered with cycloid scales of very small size; cleft of mouth narrow. Lateral line without armature. First dorsal fin with ten or eleven spines, the second and anal more developed; no detached finlets; no separate anal spines. Ventral fins long and broad, attached to the belly by a membrane and can be received in a fissure of the abdomen. Teeth small, forming single series in the jaws; teeth on the vomer and palatines. Pyloric appendages very numerous. Air-bladder present; branchiostegals six.

Tropical Atlantic, Indian and Polynesian Seas,

390. NOMEUS GRONOVII, Gm.

Gunth.. Cat. Fishes II., p. 387.

B. 6. D. 10. 1/26-27. A. 1/26-27. V. 1/5. Vert. 16/25.

The maxillary reaches to below the anterior margin of the eye. The ventrals extend to, and the pectorals beyond, the anal fin. The upper parts brown, the brown colour forming several band-like spots on the sides; anal with three brown spots; ventrals black.

Australia (Gunther), probably Western Australia.

Genus PLATYSTETHUS, Gunth.

Body oblong, compressed, scales moderate, smooth and minutely serrated on the edge; cleft of mouth narrow, oblique; snout obtuse, of moderate extent. Præopercular margin entire. The first dorsal fin continuous, with eight stout spines, the second and anal much more developed and can be received in a scaly sheath; finlets none; anal spines three; pectorals and ventrals rather short; minute teeth in the jaws; palate smooth. Branchiostegals five or six.

Norfolk Island and New Zealand.

391. PLATYSTETHUS CULTRATUM, Forst.

Gunth., Cat. Fishes II., p. 391.

Seriola cultrata, Richards. Ann. and Mag. Nat. Hist. 1843, XI., p. 169.

B. 5-6. D. 8. 1/24. A. 3/30. L. lat. 60. L. tr. 5/14. Vert. 25.

Uniform silvery, the edge of the abdomen rather sharp.

Norfolk Island.

FAMILY XXI. SCOMBRIDÆ.

Two dorsal fins; either finlets, or the spinous dorsal composed of free spines, or modified into a suctorial disk, or the ventrals jugular and composed of four rays. Scales none or very small.

Genus SCOMBER, Artedi.

Body elongate, cleft of mouth wide; scales very small, equally covering the body. Teeth small. Five or six finlets behind the dorsal and anal fins. Two slight ridges on each side of the tail. Seven branchiostegals; air-bladder simple, sometimes absent; pyloric appendages in exceeding great number.

Almost all temperate and tropical seas.

392. SCOMBER AUSTRALASICUS, Cuv. & Val.

Gunth. Cat. Fishes II., p. 359.

D. 10. 1/11 v. A. 1. 1/11 v. L. lat. about 160.

The height of the body is five times and a-half in the total length, the length of the head four and a-quarter. Teeth very distinct. Back greyish-green; sides and belly silvery. An air-bladder.

King George's Sound (Cuv. & Val.)

393, SCOMBER ANTARCTICUS, Casteln.

Proc. Zool. Soc., Victoria, Vol. I., p. 106.

"*The Mackerel*" of the South-east Coast of Australia.

D. 11. 1/11 v. A. 1/11 v. P. 20.

Height of body five times and a-quarter in the total length, head four and a-quarter; orbit five and a-half times in the length of the head. The second dorsal spine the largest, the eleventh very small; the upper part of the præoperculum is covered with scales, some beneath the eye of a very elongate form. Teeth small, hooked, and disposed in a line, on the palatine bones a line of numerous teeth rather longer than those in the jaws. No air-bladder. Colour dark greenish-blue above, silvery white below; back marked with blackish waving lines; sides with a longitudinal series of large roundish spots, beneath them numerous black dots.

Port Jackson, Victoria, and Queensland.

Genus THYNNUS, Cuv. & Val.

Body oblong; cleft of the mouth wide. The first dorsal continuous with the spines rather feeble; six to nine spurious fins behind the dorsal and anal. Scales of the pectoral region forming a corslet. Teeth rather small in the jaws and on the vomer and palatines. A longitudinal keel on each side of the tail. Seven branchiostegals. ` Air-bladder simple, sometimes absent. Pyloric appendages in exceedingly great number.

All Oceans.

394. THYNNUS AFFINIS, Cantor.

Gunth. Cat. Fishes II., p. 363.

D. 15. 3/10 VIII. A. 3/11 VII.

The height of the body is four times and a-half in the total length, the length of the head three and three-quarters; the length of the pectoral fin is six times and a-half in the total. Above blue, with oblique undulating blackish bands, directed backward and upwards; sides and belly silvery; the first dorsal fin with a brownish spot.

Port Jackson (Macl. Mus.)

395. THYNNUS PALAMYS, L.

Gunth. Cat. Fishes II., p. 364.

"*The Bonita.*"

D. 15. 1/12 VIII. A. 2/12 VII.

The height of the body is four times in the length to the middle of the fork of the tail; the length of the head three and a-half in the same. The pectoral fin reaches to the vertical from the tenth dorsal spine; the length of the posterior margin of the præoperculum is once and two-thirds in that of the inferior. Back bluish, on each side of the belly four brownish longitudinal bands.

Port Jackson (Castelnau), East Coast.

396. THYNNUS MACCOYI, Casteln.

Proc. Zool. Soc., Victoria, Vol. I., p. 104.

D. 13-14. 1/13 IX. A. 1/13 IX.

Height of body one-fourth of the length; body short and thick; lower jaw rather longer than the upper; diameter of the eye one-fifth of the length of the head. Scales very small, those of the lateral line about 180 in number, being a little larger and keeled. Colour bluish-black, with brown tinges on the sides of the head. Length 23 inches.

Melbourne.

Genus PELAMYS, Cuv. & Val.

Body oblong or slightly elongate; cleft of mouth wide. Dorsal spines feeble: seven to nine dorsal finlets, six or more anal. Scales of pectoral region forming a corslet. Teeth of moderate strength, teeth on the palatines, none on the vomer. A keel on each side of the tail. Seven branchiostegals; air-bladder none; pyloric appendages dendritical.

Ocean Fishes.

397. PELAMYS AUSTRALIS, *n. sp.*

D. 19. 3/12 VII. A. 3/12 VI.

Height of body about one-fourth of total length, snout pointed, about three times the diameter of the eye in length; the maxillary extends beyond the vertical from the posterior margin of the orbit; teeth in the jaws rather strong and far apart; præoperculum strongly striolated; lateral line wavy and nearly straight. Body naked, caudal keels very strong. Bluish on the back, silvery on the sides and belly, with seven or eight longitudinal brown bands on the back and sides.

Port Jackson (Macl. Mus.)

Genus Auxis, Cuv. & Val.

Body oblong; cleft of mouth wide; the first dorsal fin continuous, separated from the second, with the spines of moderate strength. Seven to nine dorsal and anal finlets. Scales of the pectoral region forming a corslet; teeth very small, none on the palate; a keel on each side of the tail; seven branchiostegals; no air-bladder; pyloric appendages dendritical.

All Seas.

398. Auxis rochei, Risso.

Gunth., Cat. Fishes II., p. 369.

Auxis vulgaris, Cuv. & Val., Poiss., Vol. VIII., p. 139, pl. 216.

D. 10-11/12 viii. A. 12-14 vii. Vert. 39.

The height of the body is four times and a-half (in young individuals six times) in the total length, and equals the length of the head; the pectoral fin reaches to the end of the first dorsal. Back blue, variegated with darker—uniform in old age; belly silvery.

West Australia (Castelnau).

399. Auxis Ramsayi, Casteln.

Proc. Linn. Soc. N. S. Wales, Vol. III., p. 382.

"*Horse Mackerel*" of the Sydney Fisherman.

Port Jackson.

Genus Cybium, Cuv.

Like the last genus, but with the teeth stronger and on the palate, and no corslet on the pectoral region.

All Seas.

400. Cybium Commersonii, Lacep.

Gunth., Cat. Fishes II., p. 370.

D. 16. 2/15 IX-X. A. 2/15 IX-X.

Teeth triangular, strongly compressed, close together. The height of the body is five and a-half times to seven in the total length, the length of the head four to five times. Lateral line curved under the first finlet. Above bluish, beneath silvery; back and sides with numerous oblong, vertical, brownish spots

Port Jackson (Macl. Mus.)

401. CYBIUM GUTTATUM, Cuv. & Val.

Cantor, Cat. p. 111.—Gunth., Cat. Fishes II., p. 371.

D. 16/19-20 VIII-X. A. 21-22 VII-VIII.

Teeth triangular and compressed. Height of body five times in the total length, and about equal to the head. Above blue, beneath silvery, back and sides with numerous brown spots and longitudinal bands; the greater part of the first dorsal fin black, the remainder white.

Port Jackson (Macl. Mus.)

Genus NAUCRATES, Cuv.

Body oblong, subcylindrical, covered with small scales; cleft of mouth moderate; a keel on each side of the tail; spinous dorsal reduced to a few free spines; finlets none; ventrals thoracic. Villiform teeth in the jaws, on the vomer and palatines. Seven branchiostegals; air-bladder small; pyloric appendages in moderate number.

All Seas.

402. NAUCRATES DUCTOR, L.

Gunth., Cat. Fishes II., p. 374.

Naucrates Indicus, Less., Voy. Coq., Poiss., p. 157, pl. 14.

"*The Pilot Fish.*"

D. 3-6. 1/26-28. A. 2/16-17. Cæc. pylor. 12-15. Vert. 10/16.

Bluish, with five to seven dark vertical bars.

Port Jackson.

Genus ELACATE, Cuv.

Body fusiform, covered with very small scales; head depressed; cleft of mouth moderate; no keel on the side of the tail; the spinous dorsal formed of free and small spines; no finlets; ventrals thoracic. Villiform teeth in the jaws and on the vomer and palatines. Seven branchiostegals; no air-bladder; pyloric appendages dendritical.

West Indies. Indian and Australian Seas.

403. ELACATE NIGRA, Bl.

Gunth. Cat. Fishes II., p. 375.

The "*King Fish*" of the West Indies.

D. 8/28-35. A. 25-27. Vert. 12/13.

The height of the body is one-eighth of the total length; caudal fin obliquely truncated, with the upper lobe longest. Back and the upper half of the sides brownish or bluish-black, with a light longitudinal band from above the orbit to the root of the caudal fin.

Port Jackson (Macl. Mus.)

Genus ECHENEIS, Artedi.

Body fusiform, with very small scales; head depressed; the spinous dorsal modified into an adhesive disk; no keel on the side of the tail; finlets none; ventrals thoracic. Villiform teeth on the jaws, vomer, and palatines, and generally on the tongue. Seven branchiostegals; no air-bladder; pyloric appendages in moderate number.

All Seas.

404. Echeneis remora, L.

Gunth. Cat. Fishes II., p. 378.

"*Sucking Fish*" of the English.

D. 16-18/22-24. A. 25. Cæc. pylor. 6. Vert. 12/15.

The length of the disk is three times and one-sixth in the total; the width of the body between the pectorals five and a-half. Caudal fin subcrescentic; dorsal and anal not continued to the caudal. Mouth rounded. Colour brown.

Port Essington. Bass' Straits.

405. Echeneis naucrates, L.

Gunth., Cat. Fishes II., p. 384.—All. & Macl., Proc. Linn. Soc. N.S. Wales, Vol. I., p. 321.

D. 22-25/33-41. A. 32-38. Vert. 14/16.

The length of the disk is four times and a-half to four and three-fifths in the total, or twice the width of the body between the pectoral fins; caudal fin subcrescentic in mature, more or less convex in immature, and very much produced in the middle in young specimens. Mouth rounded with the lower jaw pointed. Brown, generally a blackish band, edged with whitish, from the snout, through the eye, along the side of the body and the tail, sometimes uniform, sometimes irregular blotches instead of the band.

Darnley Island (Chevert Exp.) North Coast.

Family XXII. TRACHINIDÆ.

Body elongate, low, naked or covered with scales. Teeth in villiform bands, with pointed and conical canines in some of the genera; no molars or trenchant teeth. The infraorbital ring does not articulate with the præoperculum. One or two dorsal fins, the spinous portion always much less developed, and shorter than the soft; the anal similarly developed to the soft dorsal; ventrals with a spine and five or six rays. Gill opening more or less wide; five, six, or seven branchiostegals; pseudobranchiæ; no prominent anal papilla.

Group A. *Uranoscopina.*

Eyes on the upper surface of the head; lateral line continuous.

Genus KATHETOSTOMA, Gunth.

Head large, broad, and partly covered with bony plates; body somewhat cylindrical, cleft of mouth vertical. Scales none. One continuous dorsal fin; ventrals jugular; pectoral rays branched; some bones of the head armed. Six branchiostegals; air-bladder none.

Australian Seas.

406. KATHETOSTOMA LÆVE, Bl.

Gunth., Cat. Fishes II., p. 231.

"*Stone Lifter*" of Melbourne.

D. 17. A. 17. V. 1/5.

The length of the head is three times and two-thirds in the total. Three spines on the inferior margin of the præoperculum, two below the mandibula, two on the throat. Colour in spirits brownish above, yellowish below.

Tasmania. Melbourne.

Genus LEPTOSCOPUS, Gill.

Head as in *Kathetostoma*, but entirely covered with soft skin, body elongate, mouth nearly vertical; scales small, cycloid. One continuous dorsal fin; ventrals jugular; teeth villiform; no canines. Opercles without external spines; cavity of gills very wide, partially opened above. Six branchiostegals; pseudobranchiæ; no air-bladder.

Australian Seas.

407. Leptoscopus macropygus, Richards.

Voy. Erebus and Terror, Ichth., p. 55, pl. 33, f. 4-6.—Gunth., Cat. Fishes II., p. 232.

D. 31. A. 36. L. lat. 86 (43).

The scales of the lateral line twice as large as those of the adjoining series, each corresponding to two transverse series. The upper half of the head and body olive, mottled with brown; lateral line brown.

Port Jackson.

Group B. *Trachinina.*

Eye more or less lateral. Head not cuirassed. Lateral line continuous. Intermaxillary without larger tooth on its posterior portion.

Genus Percis, Bl.

Body cylindrical, elongate; cleft of mouth slightly oblique; eye lateral, directed upwards. Scales small, ctenoid. Dorsal fins more or less contiguous, ventrals a little before the pectorals, the lower rays branched. Villifom teeth and canines in the jaws, teeth on the vomer, none on the palatines. Operculum with two small spines, præoperculum entire or slightly denticulated. Six branchiostegals; pseudobranchiæ. No air-bladder; pyloric appendages in small number.

Indian and Polynesian Seas.

408. Percis nebulosa, Quoy. & Gaim.

Gunth., Cat. Fishes II., p. 237.

D. 5/21-22. A. 19-20. L. lat. 85. Cæc. pylor. 4. Vert. 10/20.

The height of the body is five times and a-half in the total length, the length of the head about four times; the space between the eyes is greater than their diameter. On each side two rows of brown clouded spots, those above the lateral line being the larger; the spinous dorsal fin is deep black, with a vertical white streak before the third spine and a small white spot posteriorly, the second dorsal either white with four series of brown spots, or brown with four series of white spots; caudal with indistinct whitish transverse lines.

Sharks' Bay (H.M.S. Herald). Depuch Island (Richards.).

A species not uncommon in Port Jackson is generally believed to be identical with this one. I think otherwise, but for the present I defer the description of it as a distinct species.

409. PERCIS ALLPORTI, Gunth.

Ann. and Mag. Nat. Hist., 1876, 4th ser., Vol. XVII., p. 394.

D. 5/21. A. 16. L. lat. 62. L. transv. 3½/15.

The height of the body is one-fifth, and the length of the head one-fourth of the length (without caudal). Snout longer than the eye, which is one-fourth of the length of the head. Spinous dorsal fin continuous with the soft, the spines subequal in length; sometimes, probably in the male, the first spine is longest. Caudal fin subtruncated. Greenish or yellowish-olive (in spirits), with seven black cross-bars on the back; an indistinct blackish blotch on the root of the upper caudal rays. Upper half of the caudal variegated with yellow and brown in the female; in the male the whole is uniform black.

Tasmania.

Genus APHRITIS, Cuv. & Val.

Cylindrical, elongate; cleft of mouth rather oblique; eye lateral. Scales rather small, minutely ciliated. Two separate dorsal fins, the first with six spines, ventrals jugular. Villiform teeth in the jaws, on the vomer and palatines; no canines; six branchiostegals; air-bladder none; pyloric appendages in small number.

South Pacific.

410. APHRITIS URVILLII, Cuv. & Val.

Gunth., Cat. Fishes II., p. 242.

D. 6/19. A. 25. L. lat. 65. Cœc. pylor. 4.

Palatine teeth. Caudal fin truncated. Reddish, marbled with brownish; dorsal and caudal fins with series of red dots.

Fresh-waters of Tasmania.

Genus PSEUDAPHRITIS, Casteln.

Characters of *Aphritis*, but the scales rather large; the first dorsal fin with seven spines and a short fin of two spines in front of the anal fin.

Australia.

411. PSEUDAPHRITIS BASSII, Casteln.

Proc. Zool. Soc., Victoria, Vol. I., p. 92.

D. 8/20. A. 2/22. V. 1/5.

Body elongate and subcylindrical; height seven and one-third times in the total length. Head conical, four times in the same; eye six times and three-quarters in the length of the head. The lateral line is straight; a groove extends along the summit of the back, from the head to the dorsal fin; the head is entirely covered with scales; the teeth are numerous, sharp and cardiform, and the first dorsal is composed of one spine and seven rays. Brown, with a very few faint transverse broad green bands on the back; side of head purple; red in front of the eyes; belly white, dorsal fins hyaline marbled with yellow and brown; caudal yellow with transverse crimson bands; anal pink; ventrals yellowish; pectorals yellow, with several narrow crimson lines of spots; eye yellow.

Bass's Straits (one specimen, Castelnau).

Genus SILLAGO, Cuv.

Body somewhat cylindrical, elongate; cleft of mouth small, the upper jaw longest; eye lateral, somewhat directed upwards.

Scales rather small, ctenoid. Two dorsal fins, the first with nine to twelve spines; ventrals thoracic. Villiform teeth in the jaws and on the vomer; none on the palatines. Operculum terminating in a point; præoperculum denticulated. The bones of the head with the muciferous system developed. Six branchiostegals; pseudobranchiæ; air-bladder simple; pyloric appendages in small number.

Indian and Australian Seas.

412. SILLAGO MACULATA, Quoy & Gaim.

Voy. Freyc. Zool., p. 261, pl. 53, fig. 2.—Gunth., Cat. Fishes II., p. 245.

The "*Whiting*" of the Sydney Fish Market.

D. 11. 1/20. A. 1/21. L. lat. 70. L. transv. 5-6/7.

The height of the body is five times and a-half in the total length, the space between the eyes is one-half the length of the snout; ventral spine feeble. On each side seven or eight blackish blotches and a yellow longitudinal band; the second dorsal fin dotted with blackish.

Port Jackson.

413. SILLAGO PUNCTATA, Cuv. & Val.

Quoy & Gaim., Voy. Astrol., p. 671, pl. 1, fig. 1.—Gunth., Cat. Fishes II., p. 245.

The "*Whiting*" of the Melbourne Market.

D. 12. 1/26. A. 1/22. L. lat. 170. L. transv. 35. Cæc. pylor. 4.

The height of the body is eight times in the total length, the length of the head four times and a-half. Body with numerous black spots above the lateral line; fins immaculate.

Hobson's Bay, Port Phillip. South Australia.

414. Sillago bassensis, Cuv. & Val.

Sillago ciliata, Gunth. and Cuv. & Val., Cat. Fishes II., p. 245.

S. terræ-reginæ, Casteln., Proc. Linn. Soc. N. S. Wales, Vol. II., p. 232. *S. bassensis*, Casteln., Proc. Linn. Soc. N.S. Wales, Vol. III., p. 380.

"*Trumpeter Whiting*" of the Fishermen.

Port Jackson; Brisbane; Cape York.

415. Sillago ciliata, Cuv. & Val., not of Gunth.

Casteln., Proc. Zool. Soc., Victoria, Vol. II., p. 113.

D. 11. 1/17. A. 2/16. L. lat. 63. L. transv. 16.

Height of body five times and two-thirds in the length to extremity of the middle of the tail; head three and a-half times in the same; eye five times in the head; the space between the eyes twice in the snout; the second dorsal fin covered with minute scales, also the caudal which is strongly emarginate. The colour is white and silvery, with the back darker, no longitudinal white or yellow streak on the sides: fins yellow edged with black, excepting the anal and ventrals which are bright yellow; the second dorsal with a few obscure streaks.

North Australia. Torres Straits. Cape York.

416. Sillago gracilis, All. & Macl.

Proc. Linn. Soc. N.S. Wales, Vol. I., p. 279, pl. 6, fig. 2.

Torres Straits.

Genus Isosillago, Macleay.

Proc. Linn. Soc. N. S. Wales, Vol. III., p. 34.

417. Isosillago maculata, Macleay.

Proc. Linn. Soc. N. S. Wales, Vol. III., p. 34, pl. 4, fig. 3.

King George's Sound.

Genus NEOSILLAGO, Casteln.

Cleft of mouth horizontal, with the lower jaw rather prominent. Two dorsal fins, the first with five spines; teeth on the palate, long canine teeth; præoperculum entire, pectoral fins formed of simple rays; body and snout elongate, scales rather small.

418. NEOSILLAGO MARMORATA, Casteln.

Researches on the Fishes of Australia, p. 16.

D. 5/21. A. 17. L. lat. 75.

Height of body six times in the length (without caudal) head a little over four times; eye oblong, three times and three-fourths in the length of the head, and once and a-quarter in the snout. Teeth numerous, with strong curved canines in front; spines of first dorsal fin strong but low, the second dorsal high; caudal bilobed. Head and anterior part of body red, posterior white; six large rounded obscure blotches on each side of the lateral line, the membranes of the first dorsal fin black, the other fins immaculate and white. Length 5 inches.

Port Walcott.

Genus BOVICHTHYS, Cuv. & Val.

Aspect cottoid, posterior portion of body compressed; cleft of mouth horizontal with the upper jaw rather longer; eye lateral, more or less directed upwards. Scales none. Two separate dorsal fins, the first with eight spines; ventrals jugular; the lower pectoral rays simple. Villiform teeth in jaws and on vomer and palatines, no canines. Operculum with a strong spine; præoperculum and præorbital not armed. Seven branchiostegals.

South Pacific.

419. BOVICHTHYS VARIEGATUS, Richards.

Voy, Erebus and Terror, p. 56, pl. 34, f. 1-4.—Gunth., Cat. Fishes II., p. 250.

D. 8/18. A. 13.

The soft dorsal fin is as high as the body beneath; the length of the base of the spinous dorsal is equal to, or more than, one-half of that of the soft; eyes slightly directed upwards; the width of the interorbital space is half the length of the diameter of the eye. Back with five brown cross-bars.

Port Jackson.

Group C. *Pseudochromides.*

Eyes more or less lateral. Head not cuirassed. Lateral line interrupted or not continued to the caudal fin.

Genus OPISTHOGNATHUS, Cuv.

Body rather elongate, rounded anteriorly, slightly compressed posteriorly; upper profile of snout parabolic; cleft of mouth large; the maxillary produced backwards; eye lateral, large. Scales small; lateral line not continued to the caudal. One dorsal fin with the rays flexible; ventrals jugular; lower pectoral rays branched. Cardiform teeth in the jaws, palate smooth. Opercles not armed. Six branchiostegals; the gill membrane joined together inferiorly; pseudobranchiæ, air-bladder small; pyloric appendages none.

Red Sea, Indian and Australian Seas; Coast of Brazil.

420. OPISTHOGNATHUS MACULATUS, All. & Macl.

Proc. Linn. Soc. N.S. Wales, Vol. I., p. 280, pl. 9, fig. 3.

Palm Islands.

421. OPISTHOGNATHUS DARWINIENSIS, Macleay.

Proc. Linn. Soc., N. S. Wales, Vol. II., p. 355, pl. 9, fig. 3.

Port Darwin.

422. OPISTHOGNATHUS JACKSONIENSIS, *n. sp.*

D. 26. A. 17. P. 15.

Head very round; body tapering and very compressed towards the tail; space between the eyes about one-third of their diameter; maxillary broad and rounded behind, and reaching two-thirds of the distance between the eye and the angle of the præoperculum. The lateral line extends from the back of the head close beneath the dorsal fin till near its termination. Colour yellow, with blotches of brown on the body, and with the head densely spotted and reticulated with brown; the lower margin of the maxillary and the membranes of the branchiostegals, black; the dorsal and caudal fins spotted and variegated with brown, the anal black and the pectorals round, expanded, and of a bright yellow.

Port Jackson.

Genus CICHLOPS, Mull. & Trosch.

Head and body rather compressed, more or less elongate; cleft of mouth oblique; eye lateral. Scales of moderate size, ciliated; lateral line interrupted. One dorsal fin with a few spines anteriorly; ventrals inserted before or below the pectorals. Jaws with canine teeth, vomer toothed, none on the palatines. Præoperculum entire. Six branchiostegals; pseudobranchiæ and air-bladder present; pyloric appendages none.

East Indian Archipelago.

423. CICHLOPS FILAMENTOSUS, *n. sp.*

D. 2-3/23. A. 3/12. L. lat. 40.

The height of the body is one-fourth of the total length; the snout is less than half the diameter of the eye in length; a pair of very strong canine teeth in the lower jaw; lateral line running near the dorsal fin to near the end, and then recommencing below it at about eight scales from the tail; the rays of the dorsal, caudal, anal, and ventral fins all prolonged into filaments. Colour s uniform sooty brown, with numerous minute blue spots e head.

)arwin.

424. CICHLOPS LINEATUS, Casteln.

ia lineata, Casteln., Researches Fishes of Australia, p. 30.

D. 1/27. A. 3/-?

.t one-fourth of the length, length of snout one and a- s the diameter of the eye; mouth very oblique with strong in both jaws; dorsal and anal fins prolonged behind, over two-thirds of the tail. Colour in dried specimen ith an orange tinge on the back; sixteen narrow longi- lack stripes on the body, beginning about one-third of h, and extending to the base of the caudal; the anterior he dorsal is reddish with black spots; the posterior part ectorals and ventrals yellow.

ier's Archipelago.

Castelnau in his "Researches on the Fishes of Australia," ery elaborate description of this fish, making for its a genus which he named *Dampieria*. I cannot, however ient reason for separating it from *Cichlops*.

Genus STIGMATONOTUS, Peters.

elliptical, moderately compressed; mouth deeply cleft; culum toothed; operculum armed, suborbital unarmed, with large pores; a band of small pointed teeth in the the vomer and the palatine bones; scales ctenoid, lateral mplete. A long dorsal fin with fewer spines than rays. nes three. Ventrals 1/5, somewhat before the pectorals; ing wide; branchiostegals six; gills three and a-half; adlike pseudobranchiæ; lower pharyngeals separated.

425. Stigmatonotus australis, Peters.

M.B. Ak. Berl., 1876, p. 838.—Zool. Reg. 1876, p. 20, Pisces.

D. 11/17. A. 3/8. L. lat. 46.

Dick Hartog Island, West Australia in three fathoms.

Family XXIII. BATRACHIDÆ.

Habit cottoid; skin naked or with small scales, muciferous channels of head well developed. Teeth conical, small or of moderate size. The spinous dorsal fin very short, the soft and the anal long. Ventrals jugular, with two soft rays; pectorals not pediculated. Gill opening a more or less vertical slit before the pectoral, rather narrow. Gills three, pseudobranchiæ absent; an air-bladder.

Genus Batrachus, Bl.

Head broad, depressed; body subcylindrical anteriorly and compressed posteriorly; skin naked, or covered with very small scales. No canine teeth. Gill covers with several spines. The spinous dorsal fin consists of three stout spines. Gill opening narrow. Gills three; pseudobranchiæ none; branchiostegals six; air-bladder divided, pyloric appendages none. Vertebræ 12/17-27.

Nearly all Coasts.

426. Batrachus dubius, White.

Richards., Voy. Erebus and Terror, p. 16, pl. 10.—Gunth., Cat. Fishes III., p. 169.

D. 3/18. A. 15. V. 1/2.

The length of the head is three times and a-half in the length of the body; the width of the bony bridge between the orbits is one-seventh of the length of the head and equals the diameter of the eye, which is shorter than the snout. Gill covers with three spines directed backwards, two belonging to the operculum and one or the præoperculum. Vomer and palatine bones with a single series of short conical teeth. Snout short, depressed, flat, surrounded by a wreath of short tentacles; the tentacles above the orbit very distinct. The maxillary extends to below the posterior margin of the orbit. A round foramen in the upper part of the axil. Brown, marbled with darker; some small, round deep black spots on the side of the body; dorsal fin with oblique brown bands, pectoral with many round white spots.

Port Jackson. Australian Coasts.

427. Batrachus diemensis, Lesseur.

Richards., Voy. Erebus and Terror, p. 17, pl. 8, f. 1-2.—Gunth., Cat. Fishes III., p. 170.

D. 3/20. A. 15-17. V. 1/2.

The length of the head is contained three times and three-fourths in the total; the bony bridge between the orbits is narrow, its width being one-eighth of the length of the head and much less than that of the orbit, which equals the length of the snout. Gill covers with four spines, two opercular and two subopercular, one of the latter small, and nearly obsolete in old specimens. Villiform teeth in jaws, vomer, and palatines. Snout short, obtuse (the upper profile parabolic) and surrounded by a wreath of tentacles, those above the orbits well developed, ciliated. The maxillary extends to below the middle of the orbit. No foramen in the axil. The outer ventral ray much longer than the inner one, tapering, nearly as long as the head. Brown marbled with darker.

Port Essington. Port Darwin. Cape Grenville (Chevert Exp.)

428. Batrachus Dussumieri, Cuv. & Val.

Gunth., Cat. Fishes III., p. 169.—All. & Macl., Proc. Linn. Soc. N. S. Wales, Vol. I., p. 335.

D. 0/20, A. 16. V. 1/2.

Length of head three times and a-half in the total. Gill covers with three spines directed backwards, two opercular, one subopercular. The lower jaw and palate with narrow bands of villiform teeth. Snout broad, depressed, flat, surrounded by very short tentacles, that above the orbit very small. Brown, with three rather indistinct darker cross-bands. Fins immaculate.

Darnley Island (Chevert Exp.) very doubtful.

429. Batrachus striatus, Casteln.

Pseudobatrachus striatus, Casteln., Res. Fishes Australia, p. 24.

D. 2/17. A. 14. V. 3.

Length of head three times and a-quarter in the total length, without caudal fin; the space between the eyes five times in the length of the head; and equal to the diameter of the eye; gill covers with three spines, two opercular one subopercular. Teeth short and conical. Tentacles round mouth and orbit rather short. Skin of body very loose and covered, as also the head, with strong longitudinal striæ. Colour brownish-black; length five and a-half inches.

Cape York.

Count Castelnau made a genus of this under the name of *Pseudobatrachius*, on account of the first dorsal fin being reduced to two very small spines, hidden under the skin, though very possibly the third may be too deeply hidden for recognition. If this were sufficient ground for division, we have already the genus *Thalassophryne*.

Family XXIV. PEDICULATI.

Head and anterior part of body very large, without scales. Teeth in cardiform or villiform bands. The spinous dorsal fin either composed of a few more or less isolated spines, or entirely absent. Ventrals jugular with four or five soft rays; the carpal bones prolonged, forming a sort of arm for the pectorals. Gill opening reduced to a small foramen, situated in or near the axil; gills two and a-half to three and a-half. No pseudobranchiæ.

Genus Brachionichthys, Bleek.

Head large, high, compressed; cleft of mouth directed forwards; jaws with cardiform teeth; palate smooth. Body smooth, or covered with minute spines. Three slender dorsal spines, the two posterior connected by a membrane with each other, and with the soft portion; the anterior modified into a tentacle, situated above the snout. The soft dorsal is longer than the anal. Stomach of moderate size; no air-bladder or pyloric appendages.

Tasmanian Seas.

430. Brachionichthys hirsutus, Lacep.

Gunth., Cat. Fishes III., p. 182.

D. 1. 2/19. A. 9. P. 7. V. 1/4. Vert. 12/10.

The height of the body is one-fourth of the total length. Skin rough. The anterior dorsal spine is free, terminating in a small lobe; the two others are joined into one fin, separate from the soft dorsal. Brownish-grey, with brown dots; a black spot on the second, third, and fourth dorsal rays

Tasmania.

431. Brachionichthys lævis, Lacep.

Cuv., Mem. Mus., p. 435, pl. 18, f. 3.—Gunth., Cat. Fishes III., p. 182.

D. 3/16. A. 9. P.7. V. 1/4.

Height of body one-fourth of total length; skin nearly smooth, covered with minute spines. The dorsal spines are connected with one another and with the soft dorsal by a membrane, which however is notched between the first and second spines, and between the third and the soft dorsal. Reddish-brown.

Tasmania?

432. BRACHIONICHTHYS POLITUS, Richards.

Chironectes politus, Richards., Voy. Erebus and Terror, p. 16, pl. 9, fig. 3.

D. 1. 2/17. A. 9. C. 9. P. 9. V. 1/4.

I have not seen a complete description of this Fish, but the skin is quite smooth, showing no roughness nor inequalities under a lens. It cannot therefore, as Dr. Gunther suggests, be identical with *B. lævis*, described above.

Port Arthur.

Genus ANTENNARIUS, Commers.

Head very large, high, compressed; cleft of the mouth nearly vertical; jaws and palate armed with cardiform teeth. Body naked or covered with minute spines. The spinous dorsal fin is composed of three isolated spines, the first modified into a tentacle placed above the snout. The soft dorsal of moderate length, longer than the anal. No cleft behind the fourth gill; only half of the anterior branchial arch provided with lamellæ. No pseudobranchiæ. Stomach very wide; no pyloric appendages, an air-bladder.

Tropical Seas.

433. ANTENNARIUS MARMORATUS, Less.

Gunth. Cat. Fishes III., p. 185.—Journ. Mus. Godeff., Heft. XI., pl. 100, fig. A.

Chironectes vittatus, Richards., Voy. Erebus and Terror, p. 15, pl. 9, fig. 3-4.

D. 3/12. A. 7. P. 10. Vert. 9/9.

The anterior dorsal spine is short, terminating in a small knob, with a minute tentacle attached to it, sometimes it is very short or entirely absent. The last dorsal extends beyond the root of the caudal. Head and body with cutaneous tentacles, those on the angle of the mouth, and on the belly the most conspicuous; each tentacle of the latter rooting in the centre of a round white spot; the second and third dorsal spines fringed on the top. Ground colour, yellowish or reddish, largely marbled with brown; brown spots radiating from the eye; most of the spots edged with white. Round white spots on the sides of the body, and more crowded on the belly.

Port Jackson.

A species of wide range, very variable and with many synonyms.

434. Antennarius striatus, Shaw.

Nat. Misc. V., pl. 175.—Gunth., Journ. Mus. Godeff., Heft. XI., pl. 92, fig. B.

D. 3/12. A. 7. P. 10.

The anterior dorsal spine is as long or slightly longer than the second, terminating in three long cutaneous flaps, the second and third with a cluster of small cutaneous growths at their tips. Skin very rough. Colour yellowish with many brown radiating streaks over the head and body; the fins are spotted besides.

Port Jackson; common.

435. Antennarius pinniceps, Cuv. & Val.

Gunth., Cat. Fishes III., p. 190.—Ann. and Mag. Nat. Hist., 1867, XX., p. 61.

D. 3/12. A. 7. P. 10.

The anterior dorsal spine as long as the second, terminating in three lanceolate flaps. The dorsal fin terminates at a considerable distance from the caudal. Skin rough, covered with small spines and small cutaneous fringes. Yellowish, irregularly spotted and streaked with brown; streaks radiating from the eye; a series of large, round, brown spots along the middle of the dorsal; the dorsal and anal with round spots.

Sydney (Gunther).

436. ANTENNARIUS COCCINEUS, Less. & Garn.

Voy. Coq., Poiss., p. 143, pl. 16, f. 1.—Gunth., Cat. Fishes III., p. 191.

D. 3/12. A. 7.

The head and snout are so short, that the cleft of the mouth ascends in an oblique line, which is somewhat directed backwards. The anterior dorsal spine is short, stiff, terminating in a small simple tentacle, situated between the eyes. Skin rough, covered with small spines without cutaneous fringes; the third dorsal spine nearly hidden in the skin. Red, clouded with blackish and greyish; region above the pectoral blackish.

Port Jackson (Macl. Mus.)

437. ANTENNARIUS UROPHTHALMUS, Bleek.

Gunth., Cat. Fishes III., p. 192.

Chironectes caudimaculatus, Rich., Voy. Erebus and Terror, p. 125, pl. 60, f. 8-9.

D. 3/13. A. 8. P. 9.

Anterior dorsal spine rather short, terminating in a ciliated flap; the third dorsal spine is connected by a membrane with the base of the soft dorsal. The dorsal and anal fins extend to the root of the caudal. Skin rough, covered with small spines and scattered cutaneous fringes, two at the chin being the longest. Orange-coloured, densely spotted and reticulated with black, the membrane between the caudal rays with transparent ocelli, edged with black.

Port Darwin.

438. ANTENNARIUS COMMERSONII, Lacep.

Gunth., Cat. Fishes III., p. 192.—Journ. Mus. Godeff., Heft. XI., plates 100—106.

D. 3/13-14. A. 7-8. P. 9-11.

Skin very rough, covered with small spines. The anterior dorsal spine much longer than the second, terminating in a fringed lobe. The dorsal fin terminates near the caudal, the last rays extending to the caudal fin. Nearly uniform black or brownish-black, with some white spots; pectorals and ventral fins white-edged.

Port Darwin; many varieties.

439. ANTENNARIUS TRISIGNATUS, Richards.

Voy. Erebus and Terror, Fishes, p. 15, pl. 9, fig. 1.

D. 3/13. A. 7. C. 9. P. 9. V. 5.

The first dorsal spine is long, slender, and terminates in a single cutaneous flap, the third is enveloped in the skin. Skin rough. Colour greyish, with a purplish reflection, and a minute reticulation of lighter lines. A round black spot at the base of the dorsal fin near its middle, another above the anus, and a third above the pectoral arm; an irregular whitish mottled band extends from the commencement of the soft dorsal to the rays of the pectoral. A similar band encircles the root of the tail, on the tail itself there are a number of transparent spots.

King George's Sound (Richards.).

440. ANTENNARIUS FILAMENTOSUS, Casteln.

Proc. Zool. Soc., Victoria, Vol. II., p. 65.

D. 3/13. A.8 P. 11.

The first dorsal spine is long, slender, and terminates in six or seven long tentacles, with, on each side of it, another slender filiform tentacle. Skin not spiny, but covered with large fringes, the mouth is broad, the lips tuberculose. Colour light brown, with several very large, black blotches on the body, but none on the fins, nor on the lower parts of the body; some silvery-white, small and irregular spots on the cheeks, inside the mouth and the tongue covered with white tubercles.

South Australia.

441. ANTENNARIUS SUBROTUNDATUS, Casteln.

Researches Fishes of Australia, p. 25.

Body high; upper profile circular, lower very convex, skin covered with rough asperities; tentacle of the snout terminating in a short linear filament; the second and third dorsal spines about equal and very thick, and covered with asperities; all the fins immaculate. Body light yellowish-grey, with a double series of ocellated spots on each side of the body, some of them visible on the belly. An irregular whitish ring on the base of the tail; no cutaneous tentacles on the body.

Port Walcott, West Australia (Castelnau).

442. ANTENNARIUS ASPER, *n. sp.*

The first dorsal spine slender, ringed with black, much longer than the second and terminating in a fringed knob, the next two prominent and spinose. Skin very rough and spiny. Colour yellow, spotted rather densely all over with brown; about the middle of the base of the dorsal fin a rather large, rounded, black spot in the centre of a yellow space. Tail with three series of transparent black-edged spots on the membrane between the rays.

Darnley Island (Chevert Exped.)

Mistaken by Dr. Alleyne and myself for *A. urophthalmus*. (Proc. Linn. Soc. N.S. Wales, Vol. I., p. 335.

FAMILY XXV. COTTINA.

A bony stay for the angle of the præoperculum, which is armed; the bone arising from the infraorbital ring. Body naked or covered with ordinary scales, or incompletely cuirassed with single series of plate-like scales. The spinous dorsal fin less developed than the soft or than the anal.

Genus PLATYCEPHALUS, Bl.

Head broad, very depressed, more or less armed with spines; body depressed anteriorly, sub-cylindrical posteriorly; covered with ctenoid scales. Lateral line present. Two dorsal fins, the first spine isolated; ventrals thoracic but rather remote from the root of the pectorals, no pectoral appendages. Jaws, vomer, and palatine bones with bands of villiform teeth. Air-bladder none; pyloric appendages in moderate number.

Indian and Polynesian Seas.

443. PLATYCEPHALUS INSIDIATOR, Forsk.

Gunth., Cat. Fishes II., p. 177.—Bleek., Atl. Ichth. Platyc., pl. 1, fig. 3.

D. 1. 6-7/13. A. 13. L. lat. 120. Cæc. pylor. 8. Vert. 12/15.

The length of the head is three times and three-quarters in the total length, and its width between the præopercular spines once and a-half in its length; the distance between the eyes is one-half the length of the snout. The upper surface of the head is quite flat, the ridges being scarcely prominent. Two moderate præopercular spines, the upper rather shorter than the lower. The length of the second dorsal spine is less than half that of the head. Lateral line smooth. The upper half of the caudal fin with two oblique black bands, the lower with one or two.

Western Australia, North-west Australia, Cape York.

444. PLATYCEPHALUS BASSENSIS, Cuv. & Val.

P. tasmanius, Richards., Voy. Erebus and Terror, p. 23, pl. 18, f. 1-2.—Gunth. Cat. Fishes II., p. 179.

The "*Red Flathead*," Sydney Market.

D. 1. 7/14. A. 14. L. lat. 115.

The length of the head is three times and a-half in the total, and its width between the præopercular spines once and a-half in its length. The space between the eyes is slightly concave and one-third the length of the snout. The upper surface of the head is flat, the ridges being scarcely prominent. Two præopercular spines, the lower much the longest; the second dorsal spine is rather less than half the length of the head. Lateral line smooth. Colour reddish, with a number of obscure spots, larger on the sides; dorsal, ventral, and pectoral fins spotted with brown; the posterior portion of the caudal black.

Tasmania, Melbourne, Sydney.

445. PLATYCEPHALUS FUSCUS, Cuv. & Val.

Castelnau, Proc. Linn. Soc. N. S. Wales, Vol. III., p. 379.

The "*Flathead*" of the Sydney Market.

Port Jackson, Port Phillip.

446. PLATYCEPHALUS LÆVIGATUS, Cuv. & Val.

Gunth. Cat. Fishes II., p. 179.—Casteln., Proc. Zool. Soc. Victoria, Vol. I., p. 84.

The "*Rock Flathead*" of the Melbourne Market.

D. 1. 8/14. A. 14.

Head with the ridges scarcely visible, and without any spines; the upper præopercular spine is twice as long as the lower. The space between the eyes is one-half only of their vertical diameter. Brown above, white below; anal fin white, the others spotted with brown.

Western Port, Port Phillip, Western Australia.

447. PLATYCEPHALUS PROXIMUS, Casteln.

Proc. Zool. Soc. Victoria, Vol. I., p. 85.

In general aspect like *P. lævigatus*, but differs in having the head broader in front; the eye larger and more oval; the teeth more numerous and finer; and the spinous dorsal fin only 1/7. Colour purplish-blue above, white beneath, with a few transverse spots, upper half of pectorals and inner half of dorsal fin black.

Melbourne; scarce.

448. PLATYCEPHALUS RICHARDSONII, Casteln.

Proc. Zool. Soc., Victoria, Vol. I., p. 82.

D. 1. 7/14. A. 14.

Width of body six times, and length of head three and a-half times in the total length; orbit five times in the length of the head, or six times to the end of the operculum. Head very flat and broad, rounded in front, the tranverse line before the eyes being once and a-half in the length of the head; the lower jaw longer than the upper; the ridges on the top of the head prominent and interrupted; the præopercular spines very strong, the lower being a little the longest. Colour olive-brown with numerous crimson spots, sides grey, belly white; dorsal fins spotted with brown; caudal, ventral and pectoral fins with transverse lines of orange with crimson spots; the hinder part of the tail black.

Melbourne.

449. PLATYCEPHALUS STAIGERI, Casteln.

Researches on the Fishes of Australia, p. 17.

D. 1. 7/11. A. 11.

General form elongate and narrow; the length of the head is one-third of the total length (without caudal) and its greatest width half of its length; the eye is four times and one-third in the length of the snout, and the space between the eyes twice and a quarter; the superocular ridges are very high, sharp, and serrated, forming in front of the eye a sharp hook, and running posteriorly into several radiating ridges. Only one præopercular spine. Colour almost black, with faint blacker transverse stripes;

belly whitish, fins yellow with small black spots and lines; the upper half of the first dorsal is black; the anal is white terminating in black tipped with orange; sides of head marbled with yellow.

Queensland.

450. Platycephalus cinereus, Gunth.

Proc. Zool. Soc., London, 1871, p. 661.

D. 1. 7/12. A. 12. L. lat. 120.

The length of the head is two-sevenths of the total, (without caudal), its width between the præopercular spines is once and three-fourths in its length. Upper surface of head smooth, without spines, except a minute one in front of the eye. Præopercular spines short, subequal in length, or the lower somewhat longer. Maxillary teeth villiform in a broad band, with two pair of distinct canine teeth behind on the side of the symphysis; mandibulary and palatine bands much narrower, with a series of longer conical teeth; vomerine band continuous, crescent shaped, narrowest in the middle, broadest towards each extremity, where also some larger conical teeth are mixed with the villiform teeth. Interorbital space but slightly concave, scaly, its width equal to the diameter of the eye, which is contained twice and one-third in the length of the snout. Eye without tentacle; the isolated dorsal spine short and stiff. Upper parts nearly uniform blackish-ash; dorsal fins without spots, transparent; caudal mottled with black, without bands; pectorals and ventral fins brown, with whitish reticulations.

South Australia.

451. Platycephalus inops, Jenyns.

Gunth., Cat. Fishes II., p. 180.

D. 1. 7/12. A. 12.

The length of the head is nearly twice its own breadth, and nearly one-third of the total length. Head without spines, presenting the usual ridges, which however are not very salient, the præopercular spines very short, of equal length, the lower one rounded off almost to nothing. Lateral line perfectly smooth. Above uniform deep brown, beneath white, the two colours separate by a well-defined line. First dorsal fin with a very large deep brown blotch; the second dorsal, caudal, and pectorals spotted; the anal and ventral uniform blackish-brown. (Jen.)

King George's Sound.

452. PLATYCEPHALUS JAPONICUS, Cuv. & Val.

Gunth. Cat. Fishes II., p. 181.

D. 1. 7/12. A. 12. L. lat. 100. Vert. 12/15.

The length of the head is three times and a-fifth in the total length, and its width between the præopercular spines once and four-fifths in its length; the distance between the eyes is one-fifth of the length of the snout, and concave. A series of spines along the superciliary margin, a second from the eye to the scapular, and a-third of two spines on the infraorbital ring, there are a pair of turbinal, and a pair of occipital spines besides. Two præopercular spines of rather small size, the upper the larger. The length of the third dorsal spine is twice and a-third in the length of the head. Lateral line smooth. A tongue-shaped membranaceous flap below the præopercular spines. Reddish-olive, dotted with brown; six brown bars across the back; the first dorsal with a broad oblique blackish band; the other fins spotted with brown.

Port Darwin.

453. PLATYCEPHALUS ISACANTHUS, Cuv. & Val.

Gunth., Cat. Fishes II., p. 183.

D. 1. 8/12. A. 12.

The first dorsal spine rather long and slender; the præopercular spines short and nearly equal; spines on the crown of the head and the orbit; a pair of turbinal spines; lateral line smooth; no tentacle above the orbit. Brown, with obsolete cross-bands; all the fins dotted with brown.

Port Darwin, Palm Islands, Cape Grenville.

454. PLATYCEPHALUS NEMATOPHTHALMUS, Gunth.

Gunth. Cat. Fishes II., p. 184.

D. 1. 8/11 A. 11. L. lat. 105.

The length of the head is three times and a-half in the total length; the ridges of the head with some small spines. A tentacle of moderate length above the orbit; a single flat one below the angle of the præoperculum, none at the nostril. Præopercular spines rather short, of nearly equal size. Lateral line smooth. Brownish with seven darker cross-bands on the back; fins spotted with brownish; the spines and rays of the dorsal and caudal fins crossed by fine black lines.

Port Essington. Port Darwin.

455. PLATYCEPHALUS CIRRONASUS, Richards.

Voy. Erebus and Terror, p. 114, pl. 51, f. 7-10.—Gunth., Cat. Fishes II., p. 186.

D. 1. 8/12. A. 11. L. lat. 60.

Each nostril with a cirrus of moderate length. The length of the head is one-third of the total, and its width between the præopercular spines once and five-sixths of its length. The space between the eyes is very concave, and four times and a-half in the length of the snout. Prominent spines on the upper side of the head, but none on the infraorbital ring. Two small spines at the angle of the præoperculum. Lateral line smooth. Rose-coloured, with some violet spots along the base of the dorsal fin, and some darker bars across the back of the tail. Fins dotted with rose-colour.

Botany Bay. Port Jackson.

456. PLATYCEPHALUS CASTELNAUI, *n. sp.*

D. 1. 7/14. A. 14.

Width of head between the præopercular spines about one-fourth of total length; space between the eyes very slightly concave and less than the diameter of the eye, the longitudinal diameter of which is scarcely twice in the snout; some strong teeth on the vomer and symphysis of the upper jaw. Head scaly to the muzzle, the ridges flat and very slightly spinous. The præopercular spines of moderate length, diverging, equal in length and very acute, the ridges in which they terminate parallel and well marked from the angle of the mouth and with about eight slight quadrangular depressions between them. Colour brown above with several indistinct darker cross-bands, white below; the line of demarkation on the side distinct but not straight. Fins transparent, the soft dorsal, pectorals, ventrals, and caudal more or less spotted with brown, appearing on the tail to form cross-bands.

King George's Sound (Macl. Mus.)

Genus NEOPLATYCEPHALUS, Casteln.

Form of *Platycephalus*, but having the villiform teeth very numerous, and interspersed with sharp canine teeth on both jaws and on the palatines.

If this genus be considered necessary, it will comprise *P. cinereus*, Gunth., and *P. Castelnaui*, mihi, and probably others now placed in the genus *Platycephalus*.

457. NEOPLATYCEPHALUS GRANDIS, Casteln.

Proc. Zool. Soc., Victoria, Vol. I., p. 87.

D. 1. 8/14. A. 14.

Length of head three times and two-thirds in the total; orbit seven and a-half times in length of head; the snout is rather angular in front; the upper surface of the head is smooth and presents faint uninterrupted longitudinal lines; præopercular spines strong, the lower nearly or quite twice the length of the upper. General colour pink-lilac, covered with numerous irregular orange spots; the sides yellow; the fins are transparent and rather grey; their spines and rays are marbled with orange; the caudal has four transverse lines of rather large, rounded, orange spots, and its end is black.

Melbourne; not common. Length from 20 to 23 inches.

Genus LEPIDOTRIGLA, Gunth.

Head parallelopiped, with the upper surface and the sides entirely bony; body with scales of moderate size, regularly arranged. Two dorsal fins, the first much shorter than the second. Three pectoral filaments. Villiform teeth in both the jaws and on the vomer, none on the palatine bones. Air-bladder generally with lateral muscles, often divided into two lateral parts; pyloric appendages in moderate number.

Indian and Pacific Oceans. Mediterranean Sea.

458. LEPIDOTRIGLA PAPILIO, Cuv. & Val.

Gunth. Cat. Fishes II., p. 197.

D. 9/14. A. 14. L. lat. 55. Cæc. pylor. 7.

Scales very regular, of moderate size, with spines on the free margin, those of the lateral line with a spiny keel. Præorbital not projecting beyond the snout. The spines of the dorsal rather strong and bent; the spines along the base of the dorsal fin strong, prominent, compressed. The pectoral reaches to the sixth anal ray. The first dorsal with a black spot between the fourth and seventh spines.

Port Jackson (Macl. Mus.)

459. LEPIDOTRIGLA PHALÆNA, Cuv. & Val.

Gunth., Cat. Fishes II., p. 197.

D. 9/15. A. 14.

Scales very regular, of moderate size, with spines on the free margin; those of the lateral line with a spiny keel. Præorbital not projecting beyond the snout. The spines of the dorsal rather slender and erect; the spines along the base of the dorsal fins slightly prominent. The pectoral with cross-streaks; the first dorsal with a black spot between the fourth and seventh spines.

Melbourne (Gunther).

460. LEPIDOTRIGLA SPHYNX, Cuv. & Val.

Gunth., Cat. Fishes II., p. 197.—Casteln., Proc. Zool. Soc., Victoria, Vol. I., p. 89.

D. 9/14. A. 14. Cæc. pylor. 7.

Scales as in the two previous species, lateral line with spiny keel. The spines of the dorsal fin not strong, those along the base of the dorsal fins strong, prominent, and compressed. The first dorsal with a rather large, black, white-edged spot; large rounded black spots on the back and sides.

Melbourne, (Castelnau).

461. LEPIDOTRIGLA VANESSA, Richards.

Gunth., Cat. Fishes II., p. 197.—Casteln., Proc. Zool. Soc. Vict., Vol. I., p. 89.

D. 11/17. A. 17. L. lat. 70. Cæc. pylor. 8.

Scales very regular, of moderate size, those of the lateral line with very distinct spines. The snout is rather short with the upper profile concave. Præorbital anteriorly with a triangular spine. The pectoral fin spotted and reaching to the seventh anal ray.

Port Arthur, Tasmania. Melbourne.

Genus TRIGLA, Artedi.

Head parallelopiped, with the upper surface and the sides entirely bony; body with exceedingly small scales, those of the lateral line sometimes larger. Two dorsal fins. Three pectoral filaments. Villiform teeth in both jaws and on the vomer, none on the palatine bones, Air-bladder generally with lateral muscles, often divided into two lateral parts; pyloric appendages in moderate number.

Nearly all Seas.

462. TRIGLA PLEURACANTHICA, Richards.

Voy. Erebus and Terror, Ichth., p. 23, pl. 16, f. 1-4.—Gunth., Cat. Fishes II., p. 202.

D. 8/14. A. 14. L. lat. 55.

Along the lateral line a series of imbricate, scaly plates, each angularly bent, and the edge terminating in a strong spine; the other scales small. The snout of moderate extent with the upper profile slightly concave. Traces of a black spot on the fourth, fifth, and sixth dorsal spines.

Port Jackson. (Richardson.)

463. TRIGLA KUMU, Less. & Garn.

Voy. Coquille, pl. 19.—Gunth., Cat. Fishes II., p. 204.

D. 9-10/16-17. A. 15. Cæc. pylor. 6.

Scales extremely small, those of the lateral line without any armature; the snout is elongate, the upper profile straight; the space between the eyes concave, and less than the diameter of the eye in width. Præorbital anteriorly with obtuse points; no prominent ridge along the præorbital and the angle of the præoperculum; no spine between the orbit and the superscapula. The first dorsal spine smooth, or very little granular, the second the longest, and equal to the distance between the anterior nostril and the angle of the præoperculum. The pectoral fin reaches to the vertical from the tenth dorsal ray. Reddish, pectoral fins greenish-blue with a large black blotch and several white spots.

Port Jackson.

464. Trigla polyommata, Richards.

Trans. Zool. Soc., Vol. III., p. 87, pl 5, f. 2.—Gunth.. Cat. Fishes II., p. 204.

"The Flying Gurnet."

D. 9/15. A. 14. Cæc. pylor. 8.

Scales exceedingly small. Præorbital, suprascapula, coracoid, operculum, præoperculum with very long and strong spines; the space between the eyes very concave and equal to the diameter of the eye in width. Dorsal spines rather stout. The pectoral fin reaches to the vertical from the tenth anal ray. Red, pectorals greenish beneath reticulated with blue, and with, on the inner side, two large, oblong, black, white-edged spots.

Port Jackson. Port Phillip. Western Australia.

465. Trigla amæna, Casteln.

Proc. Zool. Soc., Victoria, Vol. II., p. 131.

D. 9/15. A. 14.

Scales very small, those on the lateral line without any armature; snout elongate; upper profile concave; the anterior part of the head rather bilobed; the space between the eyes very concave, and less in width than the diameter of the eye. A crenulated ridge in front of the orbit, the inferior part of the præoperculum forming a prolonged angle, but no point; the pectoral fins reach to the vertical from the tenth anal ray. Colour lavender-grey, with the lower parts silvery and of a light milky-blue; a black blotch from the first to the third dorsal spines; pectorals olive-green, with numerous oblong spots of a dull cobalt, and a large black blotch near the inner-side.

West Australia. Length six to eight inches.

Genus BERIDIA, Castelnau.

Proc. Linn. Soc. N. S. Wales, Vol. II., p. 229.

466. BERIDIA FLAVA, Casteln.

Proc. Linn. Soc. N. S. Wales, Vol. II., p. 229, pl. 2.

Portland Bay, Victoria.

FAMILY XXVI. CATAPHRACTI.

Triglidæ with the body completely cuirassed with bony keeled scales or plates. Pyloric appendages in small or moderate number.

Genus DACTYLOPTERUS, Lacep.

Head parallelopiped, with the upper surface and sides entirely bony; scapula and angle of the præoperculum produced into long spines; body with scales strongly keeled and of moderate size; lateral line none. Two dorsal fins; pectoral very long with the lower portion detached and shorter. Granular teeth in the jaws, none on the palate.

Nearly all Seas.

467. DACTYLOPTERUS ORIENTALIS, Cuv. and Val.

Gunth., Cat. Fishes II., p. 222.

D. 1/1/5/8. A. 6. Cæc. pylor. 19.

A long isolated ray-like filament behind the occiput, another shorter one half way between the former and the dorsal fin, the first dorsal spine detached from the others. The distance between the eyes is one-third of the length of the head, and nearly equal to that of the præopercular spine; the distance between the two scapular spines is rather less than the depth of the notch between. Pectoral fins spotted with brown and dotted with bluish-white.

Port Jackson. Endeavour River.

DIVISION IX. ACANTH. GOBIIFORMES.

The spinous dorsal or spinous portion of the dorsal always present, short, either composed of flexible spines or much less developed than the soft; the soft dorsal and anal fins of equal extent. Ventrals thoracic or jugular, if present, composed of one spine and five, rarely four soft rays. A prominent anal papilla.

FAMILY XXVII. GOBIIDÆ.

Body elongate, low, naked or scaly. Teeth generally small, sometimes with canines. The infraorbital ring does not articulate with the præoperculum. The two dorsal fins separated or more or less united, the spinous portion being always the less developed and composed of flexible spines; the anal similarly developed as the soft dorsal; ventrals with one spine and five rays, sometimes both ventrals united into a disk. Gill openings more or less narrow, the gill membrane being attached to the isthmus; four gills; pseudobranchiæ. A prominent papilla near the vent. Air bladder generally absent. Pyloric appendages none.

Genus GOBIUS, Artedi.

Body more or less elongate, scaly. Teeth in several series in the upper jaw, conical and fixed, generally small, sometimes with canines. Two dorsal fins, the anterior with six, rarely with five or more flexible spines, the posterior of greater, sometimes much greater extent than the anterior. Anal fin similar to the posterior dorsal in form and size, terminating at some distance from the caudal. Ventrals united into a disk which is not attached to the belly. Anal papilla generally distinct. Gill opening vertical, of moderate width, the gill membranes united to the isthmus. Branchiostegals five; gills four; pseudobranchiæ. Vertebræ 11-12/15-16.

Found in all seas and in many rivers.

468. GOBIUS ORNATUS, Rüpp.

Gunth., Cat. Fishes III., p. 21.

G. interstinctus, Richards, Voy. Ereb. and Terr., p. 3, pl. 5, f. 3-6.

D. 6. 1/10-11. A. 1/8-9. L. lat. 26.

Seven longitudinal series of scales between the second dorsal and the anal fin. The height of the body is six or seven times in the total length, the length of the head four times and a-half; the head is rather broader than high, its width being one and a-half times in its length. The eyes are very close together; their diameter is three times and a-half in the length of the head. Snout obtuse, convex, as long as the eye. Crown of the head scaly. The cleft of the mouth scarcely oblique, the jaws about equal in length. All the teeth very small. Dorsal fins somewhat lower than the body; caudal rounded; the upper rays of the pectoral silk-like. Green, with numerous brown spots and yellow dots; all the fins, except the ventrals, dotted with black.

Port Darwin. North-west Australia.

469. GOBIUS GIURIS, Buch.

Gunth., Cat. Fishes III., p. 21. Many synonyms.

B. 4. D. 6/9. A. 1/8. L. lat. 30-33. Vert. 11/16.

Nine or ten scales between the second dorsal and anal fins. Snout elongate, depressed, with the lower jaw prominent; head broader than high; the teeth of the outer series enlarged; no canines. Scales of neck much smaller than those on sides of body. The height of the body is one sixth or one-seventh of the total length; the length of the head one-fourth. The interorbital space is flat; and in immature specimens narrow. Dorsal fins about as high as the body, the spines sometimes a little prolonged in adults. The distance of the first dorsal from the eye, about equals that of the snout from the præoperculum. No silk-like pectoral rays; the ventrals reach nearly to the vent. Yellowish-brown with more or less distinct brown bands across the back and with a series of round, brown, blotches along the sides. Pectoral, dorsal and caudal fins with series of brown dots, the former with a small brownish spot on the upper part of the base; generally a brown cross-streak between the eyes.

Port Darwin (Macl. Mus.)

470. GOBIUS ALBOPUNCTATUS, Cuv. & Val.

Gunth., Cat. Fishes III., p. 25.

D. 6. 1/9. A. 1/8. L. lat. 35.

Ten longitudinal series of scales between second dorsal and anal fins. Head broader than high; no canine teeth. Height of body five-times and a-half in the total length, the length of the head four times and a-third. Snout somewhat longer than the diameter of the eye; interorbital space narrow. Dorsal fins not very close together, the anterior lower than the posterior, which is nearly as high as the body. The distance of the first dorsal from the eye equals that of the snout from the præoperculum. Upper pectoral rays silk-like; the ventral has the basal membrane well developed, and does not extend to the vent. Scales on the nape smaller than those on sides of body. Reddish-brown (in spirits) marbled with darker, sides of head and body dotted with silvery, the dots forming series along the rows of the scales. Dorsal and caudal fins greyish, dotted with black, the dots forming three series on the anterior dorsal, and two on the posterior; the other fins uniform greyish.

Port Essington. Port Darwin.

471. GOBIUS CRINIGER, Cuv. & Val.

Richards, Voy. Ereb. and Terr., p. 2, pl. 1, f. 3-4.—Gunth., Cat. Fishes III., p. 29.

B. 4. D. 6. 1/9. A. 1/9. L. lat. 34.

Nine series of scales between second dorsal and anal fins. Height of body one-sixth of total length, length of head one-fourth; the latter is nearly half as high as long, a quarter less broad than high. The eye occupies the second quarter of the length of the head; the width of the interorbital space is one half of the diameter of the eye. Snout short; teeth small. Head and neck naked. The dorsal fins equal in height, as high as the body; the second spine sometimes produced, filiform; caudal rounded; none of the pectoral rays silk-like. Pale ochreous; head, body, dorsal, and caudal fins irregularly spotted with black, some of the spots being very large; caudal and anal fins with black margins.

North-west Coast. Port Darwin. Darnley Island.

472. GOBIUS DARNLEYENSIS, All. & Macl.

Proc. Linn. Soc. N.S. Wales, Vol. I., p. 331, pl. 12, fig. 1.

Darnley Island (Chevert Exp.)

473. GOBIUS NIGRIPINNIS, All. & Macl.

Proc. Linn. Soc. N.S. Wales, Vol. I., p. 332, pl. 12, fig. 2.

Palm Islands (Chevert Exp.)

474. GOBIUS MAXILLARIS, Macl.

Proc. Linn. Soc. N.S. Wales, Vol. II., p. 357, pl. 9, fig. 2.

Port Darwin.

475. GOBIUS FRENATUS, Gunth.

Gunth., Cat. Fishes III., p. 39.

D. 6. 1/10. A. 1/10. L. lat. 35.

Ten series of scales between the second dorsal and the anal fin. Height of body nearly six times in the total length, the length of head four times and a-half; the head is higher than broad; the snout obtuse, convex, much longer than the eye; the cleft of the mouth oblique, jaws equal; the maxillary reaches the vertical from the anterior margin of the eye. Teeth of the outer series enlarged, a canine tooth on each side of the lower jaw. The width of the interorbital space is somewhat less than the diameter of the eye, which is nearly one-seventh of the length of the head. Head and nape naked. The dorsal fins are equal in height, and lower than the body, the second, third, and fourth spines are the highest, terminating in very fine short filaments; caudal fin rounded, one-fifth of the total length; the ventral reaches nearly to the vent; none of the pectoral rays silk-like. Brown, (in spirits) with darker spots; head with indistinct darker spots; a blackish band edged with lighter from the maxillary to the lower part of the root of the pectoral, another, narrower, and sometimes indistinct, runs parallel to the former to the upper part of the root of the pectoral; dorsals with a transparent margin, the anterior brownish, the posterior with oblique blackish lines; the upper half of the caudal with brown crescent shaped dots between the rays, anal, ventral and pectoral blackish; the latter with the base of lighter colour and with two blackish spots produced by the bands described.

Australia (Gunther).

476. GOBIUS BIFRENATUS, Kner.

Kner., Voy. Novara, Fishes, p. 177, pl. 7, fig. 3.

Gobius bassensis, Casteln., Proc. Zool. Soc., Victoria, I., p. 123.

D. 6/11. A. 11. L. lat. 38-40.

Height of body seven times and one-third in the total length; head four times and two-thirds; eye four times and a-third in length of the head; no canine teeth. Head and nape naked; caudal fin as long as the head and pointed; no silk-like pectoral rays. Colour lightish-grey, rather darker on the back, a brown band from the eye to the upper edge of the root of the pectoral fin, a second descends obliquely from beneath the first, to the lower part of the pectoral, both bands distinctly marked on the base of the fin. The dorsal fins are marked by a longitudinal narrow brown band; the caudal has several transverse series of spots on its upper half; the anal and ventrals are white, without spots; pectorals yellowish. A series of large spots forming a longitudinal line on the sides of the belly.

Melbourne. Port Jackson.

477. GOBIUS CASTELNAUI, *n. sp.*

Gobius frenatus, Casteln., Proc. Zool. Soc., Victoria, I., p. 123.

D. 6. 1/10. A. 1/10. L. lat. 36.

Height of body six times and one-third in the total length; dorsal spines all soft; one canine tooth on each side of the lower jaw. Caudal fin rather rounded and subelongate. Of a light green colour, with two irregular longitudinal black bands on the operculum which curve downwards below the eye. There are some light blue spots on the operculum, and a double longitudinal series of similar spots on the body. The dorsal fins are green, finely edged with black; the caudal has the base reddish; the anal is of the general ground colour, but covered with very minute black dots; the ventrals are green with a large black blotch, the pectorals are olive-green with the opercular bands marked on their base.

Hobson's Bay (Castelnau).

Count Castelnau has given the foregoing description of a Melbourne species, under the impression that it was the *G. frenatus* of Gunther. It is evidently quite distinct and I have therefore given it the name of its original describer.

478, GOBIUS SEMIFRENATUS, *n. sp*

D. 6/11. A. 11. L. lat. 31.

Eight series of scales between the second dorsal and anal fins; height of body one-seventh of the total length; space between the eyes less than half their diameter; length of snout more than their diameter; caudal fin pointed; no canine teeth. Reddish-brown, with eight or nine fascia-like blotches on the sides, the sides of the head are marked with brown bands as in *G. frenatus*, there are numerous brown spots on the head and lips, and one on the lower part of the operculum, the scales of the body have each a pale pearly or bluish spot; the first branchiostegal also is margined at the angle with black. The fins are for the most pale and semitransparent; both dorsals are dotted with brown; there are also minute brown dots on the rays of the tail, except on the upper and lower margins and the extremity; the ventrals are sometimes darker in centre.

Port Jackson.

479. GOBIUS PICTUS, Casteln.

Proc. Zool. Soc., Victoria, I., p. 124.

D. 8. 1/10. A. 1/9.

The height of the body is five and a-half times in the total length; the lower jaw longer than the upper; scales large; the second dorsal spine longer than the others. Colour light lilac, beneath white; on the head are numerous small, brown spots, and on the back and sides also there is a longitudinal line of black spots with terminals and a large one at the root of the caudal, on which are also two or three irregular black spots; the pectorals are yellow; the ventrals white; the eye is yellow with an external red circle; the first dorsal is white with two broad, longitudinal brown bands; the second dorsal is white, diaphanous, with the spine brown and the rays variegated with brownish red, and a broad terminal brown band; the caudal has three transverse brown-light-red bands; the anal is white.

St. Kilda, Melbourne (Castelnau).

480. GOBIUS PULCHELLUS, Casteln.

Proc. Zool. Soc., Victoria, I., p. 125.

D. 6/12. A. 1/9. L. lat. 23.

Height of body four times and three-quarters in the total length; head three and a-half times. Eyes rather large, placed on the upper surface of the head; the first dorsal fin rounded, the third spine longest, the caudal is rounded; pectorals extending to nearly the end of the first dorsal. Colour light grey, with the edges of the scales brown, towards the belly opal and white; head marbled with white spots, operculum with very minute, black dots; three large, round, black spots on the sides—opposite the commencement of the second dorsal, opposite its termination, and at the root of the tail. The dorsal fins hyaline, spotted with brown, a black spot at the commencement of the first, and the second margined with yellow. Caudal spotted with brown, the spots forming five or six transverse lines, anal white, edged with black; pectoral yellow with very small dots.

Western Port (Castelnau).

481. GOBIUS CAUDATUS, Casteln.

Proc. Zool. Soc., Victoria, Vol. II., p. 47.

D. 6/11. A. 11.

Height of body four times in the length (without caudal); head four times; eye three and a-half times in the length of the head; lower jaw longer than the upper; teeth small, some rather longer than others; the fifth dorsal spine the longest, produced into a short filament; the last ray of the second dorsal and anal fins somewhat elongate; the caudal large, pointed, the central rays produced into filaments; half as long as the body. Colour (dried) light brown, with obscure spots, a dark oblique band from the eyes to the operculum; fins diaphanous, an obscure band along the middle of the first dorsal, the soft dorsal and anal margined with black; a few obscure transverse bands on the caudal.

Melbourne (Castelnau).

482. GOBIUS MACULATUS, Casteln.

Researches on the Fishes of Australia, p. 20.

D. 6/12. A. 9. L. lat. 29.

Height of body about five times in the total length; head four times; eye less than four times in the length of the head; no canines; scales very large and strongly ciliated. General colour light grey, with four longitudinal lines of well defined, oblong, black spots, between which are numerous small white dots, placed irregularly; belly white; all the fins dark with transverse lines of white points; ventrals black.

Queensland (Castelnau).

483. GOBIUS BUCCATUS, Cuv. & Val.

Gunth., Cat. Fishes III., p. 14.

D. 6. 1/11. A. 1/10.

Cheeks swollen. Head as broad as long and one-third broader than high and one-fourth of the total length. Mouth nearly vertical. The diameter of the eye is one-sixth of the length of the head, and one-half of the width of the interorbital space. None of the pectoral rays silk-like. Scales moderate. Entirely reddish-brown, fins minutely spotted.

Sydney (Macl. Mus.)

484. GOBIUS GIBBOSUS, *n. sp.*

D. 6/10. A. 10. L. lat. 25.

Head higher than its length, broad and rounded in front, with the eyes small and two diameters apart; the snout is very round, the mouth in the centre, small and very oblique, teeth small and very acute with small canines in the lower jaw. Height of body about one-fourth of total length; tail rounded. Scales large, slightly ciliated, the top of the head and nape as far as the first dorsal entirely naked. Colour uniform reddish-yellow, fins a a little obscure.

Endeavour River (Macl. Mus.)

In the blunt rounded head this species has much the appearance of a *Gobiodon*. My specimens are from one to two inches in length.

485. Gobius lateralis, *n. sp.*

D. 6/9. A. 9. L. lat. 30.

Height of body one-seventh of the total length. Head somewhat flat; the eyes oval, close together and looking upwards; mouth slightly oblique; teeth minute; no canines. Tail pointed, wedge-shaped; the posterior rays of the soft dorsal and anal fins somewhat elongate, reaching to the caudal. Colour reddish-yellow, indistinctly dotted and mottled with brown, on the head there are also some lighter markings, the colour not showing in spirit specimens, along the middle of each side of the body there are five large, reddish-brown spots; the last on the root of the tail; the dorsal fins are both speckled with brown, the first spine of the first dorsal with a black blotch; the caudal has on its upper half about eight transverse series of brownish dots; the anal is margined with black; the ventrals are slightly blackish towards the apex, and the pectorals are large, yellow and without spot.

King George's Sound (Macl. Mus.)

486. Gobius flavidus, *n. sp.*

D. 6/11. A. 9. L. lat. 40.

Height of body about one-sixth of the total length. Head rather flat above, with the eyes near the top and close together; snout, about equal in length to the diameter of the eye, rounded in front and with thick lips; teeth very small. Scales rather small; the dorsal fins about half the height of the body, the membranes extending to the extremity of the spines and rays; tail rounded; pectoral fins large, the upper rays silk-like. Colour pale reddish-yellow, sometimes mottled with a deeper shade of red; fins white, but not very transparent, the two dorsals and the caudal faintly spotted with brown, the spots most distinct on the first ray of each.

Port Jackson. Specimens about one and a-half inches long.

487. GOBIUS SCABRICEPS, *n. sp.*

D. 6/10. A. 10. L. lat. 24.

Height of body one-fourth of the total length. Head higher than long, very convex above and very round in front; the space between the eyes equal to more than twice their diameter, mouth small, very oblique; chin very convex. Scales large, none on the head, nape, and along the back at base of dorsal fins, the head entirely covered with cutaneous short thread-like filaments, thickest and longest on the under part of the head; the membranes of the fins thick and opaque; the tail rounded; pectorals large; ventrals forming a very round disk. Colour uniform reddish-brown.

Endeavour River (Macl. Mus.). One and a-half inches long.

A very remarkable form, approaching nearest to *G. gibbosus*, mihi.

488. GOBIUS NIGROOCELLATUS, Gunth.

Journ. Mus. Godeff., Heft. II., p. 101.

D. 6. 1/10. A. 1/9. L. lat. 27.

Eight longitudinal series of scales between the second dorsal fin and the anal. The scales behind the head are a little smaller than those of the body. The height of the body is one-fifth of the entire length, without the caudal fin, the length of the head one-fourth. The eyes close together, of moderate size. Mouth small, horizontal with overlapping upper jaw. Strong curved canine teeth on the side of the under jaw. Snout shorter than the eye. The upper rays of the pectoral fin silk-like; the fin itself as long as the head. All the fin-rays flexible, those of the second dorsal about as high as the body beneath them. Caudal fin of moderate length and rounded. The ventral fins reach almost to the anal. Greyish-brown (in spirits) each scale with a paler centre. Two rows of deep black, light-margined ocelli along the side of the body—the upper row runs on the third longitudinal row of scales; the under along the fifth. The vertical fins are tipped with brown. A short, black, streak at the base of the pectorals. Ventrals black in the middle, yellow on the sides.

Bowen, Queensland. Length two and a-half inches.

489. GOBIUS SAUROIDES, Casteln.

Proc. Linn. Soc. N.S. Wales, Vol. III., p. 48.

Norman River.

490. GOBIUS MICROPHTHALMUS, Gunth.

Gunth., Cat. Fishes III., p. 44, and note, p. 550.

D. 6/8. A. 7. L. lat. 27.

Ten series of scales between the origin of the posterior dorsal and anal fins. Head and body very compressed, the height of the body three times and three-fifths in the total length, the length of the head four times. The depth of the head above the præoperculum is not much less than its length, and much more than its width. Eye rather small, its diameter being one-seventh of the length of the head, equal to width of the interorbital space, and less than the extent of the snout. Cleft of mouth slightly oblique, wide, reaching to the vertical from the posterior margin of the eye, with the jaws equal in front; a pair of small canine teeth in the front of each jaw. Scales minutely striated and ciliated. The two anterior dorsal spines are the longest, somewhat produced, but much lower than the body. Caudal fin rounded; the pectoral has no silk-like rays, and reaches to the anal; ventral reaches to the vent, with the basal membrane well developed. Brownish (in spirits) with irregular, narrow, oblique, darker streaks; the anterior dorsal fin with two black, longitudinal stripes, the lower of which is dilated into a blackish blotch posteriorly; the second dorsal with three rather irregular, serrated blackish bands, with white spots between them; caudal dotted with brown; anal blackish.

Australia (Gunther). Under two inches in length.

491. GOBIUS NUCHIFASCIATUS, Gunth.

Journal Mus. Godeff., Band I., Heft. 4, p. 90,

D. 6/12. A. 9. L. lat. 25.

Nine longitudinal rows of scales between the second dorsal fin and the anal. The length of the head is rather more than the height of the body and is two-sevenths of the total length without the caudal fin. The head is longer than high, and higher than broad. Snout much shorter than the eye, which is of moderate size. Cleft of the mouth oblique, reaching to beneath the middle of the orbit, with a somewhat projecting under jaw. Eyes close together. Two or three canine teeth on each side of the under jaw. The head, and nape nearly to the dorsal fin without scales. The ventral fins cover the anal. The dorsal fins are scarcely so high as the body beneath them, but the second and third rays are prolonged into very fine filaments. Caudal fin rounded. Body uniformly greenish, three grey, dark-bordered, oblique bands over the nape, curved forwards on the side of the head. The foremost under the eyes extends to the posterior end of the maxillary bone. The second dorsal, the caudal, and the anal fins finely spotted.

Bowen (Queensland). Length one and a-quarter inch.

B. *Scales small, L. lat.* 50 *or more.*

492. GOBIUS PAPUENSIS, Cuv. & Val.

Gunth., Cat. Fishes III., p. 49.

D. 6. 1/12. A. 1/13. L. lat. 75-80.

Scales small anteriorly, becoming larger on the tail; the height of the body is one-seventh of the length (without caudal), the length of the head one-fourth. The head is one-third longer than high, and one third higher than broad; the eyes are very close together, their diameter being one-fifth of the length of the head. Mouth oblique, the maxillary extending to below the middle of the eye, teeth of the outer series enlarged. The length of the caudal fin is one-fourth of the total, and is elongate and pointed. Greyish brown, clouded with darker, a brown spot at the root of the caudal fin, another at the base of the pectoral; dorsals with five reticulated lines.

Australia (Gunther).

493. GOBIUS CRASSILABRIS, Gunth.

Gunth., Cat. Fishes III., p. 63.—Ann. and Mag. Nat. Hist. 1867, XX., p. 61.

D. 6/11. A. 11. L. lat. 60.

Fifteen series of scales between the second dorsal and anal fins. Height of body six times and a-half in total length; length of head three times and a-half. Head flat, depressed, as broad as high; snout elongate; cleft of mouth horizontal, upper jaw longest, lips thick; teeth small; the maxillary reaches to or slightly beyond the vertical from the anterior margin of the eye. The width of the interorbital space equals the diameter of the eye, which is one-sixth of the length of the head. Head naked, scales of body smaller anteriorly. The dorsal fins lower than the body, caudal rounded, ventrals short, with a broad basal membrane. Yellowish or brownish, sides of head and body with irregular black spots, forming a band from the pectorals to the tail, at the root of which there is a round, deep, black streak superiorly on the base of the pectoral. Dorsal, caudal, and pectoral fins dotted with brown, the dots being arranged in longitudinal series in the first, and in transverse ones on the two last; ventral and anal blackish.

Australia (Gunther). Length five to six inches.

494. Gobius Bynoensis, Richards.

Voy. Erebus and Terror, p. 1, pl. 1, f. 1-2.—Gunth., Cat. Fishes III., p. 70.

D. 6. 1/16. A. 1/15. L. lat. 65.

Height of body five times and a-half in total length, length of head five times. Head higher than broad; snout obtuse; mouth slightly oblique, teeth of outer series enlarged; lower jaw with a pair of canines. Width of interorbital space half the diameter of the orbit, which is one-fifth of the length of the head. The first dorsal fin is higher than the second and lower than the body, its distance from the eye is more than that of the snout from the præoperculum. Caudal fin rounded; none of the pectoral rays silk-like. Greenish: back with four or five brownish-violet cross-bands; on each side of the head two brownish-violet, blue-edged longitudinal bands, the lower of which terminates in a dark spot on the upper part of the base of the pectoral fin; neck with two series of brown, blue-edged ocelli; dorsal fins dotted with white; caudal with a brown spot on the upper part of its base; anal with violet margin; the other fins rose-coloured.

Western Australia. Port Essington.

495. Gobius Voigtii, Bleek.

Gunth., Cat. Fishes III., p. 72.

D. 6. 1/10. A. 1/10. L. lat. 80.

Height of body seven times in the total length; length of head four times and four-fifths; the head higher than broad; the snout convex, shorter than the eyes, which are very close together, and one-fourth the length of the head. Mouth oblique, jaws nearly equal, teeth of outer series enlarged, a pair of lateral canine teeth in the lower jaw. Head and neck naked. The first dorsal fin is much higher, the second lower than the body; the length of the caudal is four times and a-quarter in the total. Greenish: with eight brownish cross-bands; head with round, blue, darker-edged spots; the first dorsal spine broadly annulated with brown, a black spot between the fourth and fifth spines; the second dorsal fin blue spotted, and with a blue longitudinal line near the margin; caudal orange-coloured, superiorly and inferiorly violet, superiorly with two oblique blue streaks; the other fins violet.

Port Essington. Cape York.

496. GOBIUS FILAMENTOSUS, Casteln.

Casteln., Researches on the Fishes of Australia, p. 19.

D. 6/11. A. 11. L. lat. 55.

Height of body seven times and one-third in the total length, the head four times and two-thirds; the diameter of the eye is one-fifth of the length of the head, and twice the width of the interorbital space; the snout is longer than the eye; the cleft of the mouth oblique; the maxillary reaches beyond the vertical from the anterior morgin of the eye; scales of body much larger towards the posterior portion. The last spine of the first dorsal fin terminates in short filaments; the two first rays of the second dorsal are somewhat prolonged, and the posterior rays are prolonged beyond the base of the caudal. The caudal is pointed, the middle rays elongate; the pectorals are large, the rays filamentary. Brownish-black (in spirits); the head bluish, the fins black; the dorsals, caudal, and anal bordered with yellow; the base of the pectorals and ventrals white.

South Australia.

497. GOBIUS MICROLEPIDOTUS, Casteln.

Casteln., Researches on the Fishes of Australia, p. 20.

Anterior dorsal fin with six spines; scales very minute, about 85 in a lateral line; height of body four times and a-third in the length (without caudal); the length of the head four times; head rounded in front; space between the eyes equal to their diameter, which is about one fourth of the length of the head; four canine teeth; caudal fin elongate, pointed. Colour, obscure brownish-olive, rather silvery beneath; an obscure longitudinal band extends from below the eyes to the base of the pectoral fins, sometimes extending along the sides; a black blotch is visible on the base of the caudal fin.

Cape York, (Castelnau). Three inches long.

498. GOBIUS MUCOSUS, Gunth.

Proc. Zool. Soc., London, 1871, p. 663, pl. 63, fig. A.

D. 6. 1/11. A. 10.

Scales very small and hidden below a thick mucous covering, which envelops all parts, and forms on the snout and sides of the head transverse and longitudinal ridges. Height of body one-fifth of the length (without caudal), length of head two-sevenths. Head rather depressed, its depth being one half its length. Snout moderately produced; the posterior margin of the orbit occupying nearly the middle of the head. The diameter of the eye equals the width of the interorbital space, and is one-fifth of the length of the head. Mouth small, subvertical, the angle at a considerable distance from the eye. Teeth very small, in bands, without canines. Dorsal and anal fins not elevated; caudal pointed, longer than the head; the pectorals reach the origin of the soft dorsal; the ventrals do not nearly reach the vent. Body reticulated with blackish; all the fins except the ventrals with blackish spots.

South Australia.

499. GOBIUS PLATYSTOMA, Gunth.

Proc. Zool. Soc., London, 1871, p. 664, pl. 63, fig. B.

D. 6/10. A. 9. L. lat. 60.

Twenty series of scales between the origin of the second dorsal fin and the anal. Head and anterior part of the body broad and rather depressed. The broad, rounded snout projects somewhat over the large mouth. The height of the body is one-fifth of the length (without caudal) the length of the head nearly one-fourth. Eye small, only half the width of the interorbital space; the maxillary extends to below the hind margin of the orbit. No canine teeth; head entirely naked; dorsal and anal fins low; caudal obtusely rounded; ventral short, terminating a great distance from the vent, its basal membrane well developed; the free portion of the tail scarcely longer than deep. Brownish, with some indistinct darker spots; the spinous dorsal fin with a dark spot behind.

Port Mackay.

500. GOBIUS CRISTATUS, *n. sp.*

D. 6/12. A. 12.

Height of body seven times in the total length, length of head four times and a-half. Head slightly depressed, body compressed; eyes nearly their diameter apart, and about the same distance from the snout; mouth oblique; teeth rather strong and numerous, strong canines in the lower jaw; cheeks swollen; a long skinny flap or crest along the nape from the eyes to the dorsal fin; scales minute. The second, third, fourth, and fifth rays of the first dorsal fin much prolonged and filamentose; caudal large, acutely rounded. Colour (in spirits) brownish-black, with indistinct traces of spots and other darker markings; the fins are not quite so dark; the first rays of both dorsals with a few black spots, the pectorals entirely spotted, the ventrals black and very short.

Port Jackson. Abundant, four inches long.

Genus APOCRYPTES, Cuv. & Val.

Body elongate, covered with small scales which become larger posteriorly; gill-openings of moderate width. Teeth in a single series, conical and fixed, with canines in both jaws, or at least in the lower. The spinous portion of the dorsal fin separate from or continuous with the soft. Ventral fins united, not adherent to the belly. Pseudobranchiæ rudimentary. Vertebræ 12/15.

East Indian and Australian Seas and Rivers.

501. APOCRYPTES LINEATUS, All. & Macl.

Proc. Linn. Soc., N. S. Wales, Vol. I., p. 332, pl. 12, fig. 3.

Cape Grenville. Palm Islands. (Chevert Exp.)

502. APOCRYPTES BIVITTATUS, Macl.

Proc. Linn. Soc. N. S. Wales, Vol. II., p. 357, pl. 9, fig. 5.

Port Darwin.

503. APOCRYPTES MACROPHTHALMUS, Casteln.

Proc. Zool. Soc. Victoria, Vol. II., p. 87.

D. 5/27. A. 25.

Height of body eight times and a-quarter in the total length, length of head five times; eye four and a-half times in the length of the head; snout very convex, and a little longer than the diameter of the eye. Eyes prominent, on the upper part of the head; head broad behind; upper jaw longest; cleft of mouth nearly horizontal and extending to beneath the posterior part of the eye. Teeth strong, canine-like; some short tentaculæ on the lower jaw; scales very minute, embedded in the skin. Body narrow, compressed, not more than half the width of the head, and tapering to the tail. Caudal fin lanceolate and united by a membrane to dorsal and anal; the last rays of the first, and the first two of the second dorsal, somewhat filamentose. Colour a light silvery grey, with the upper parts darker.

Port Darwin.

Genus GOBIOSOMA, Girard.

Scales none. Body elongate, cylindrical; head not compressed; teeth small, villiform or cardiform. Two dorsal fins, the posterior of greater extent. Anal similar to the soft dorsal; ventrals united to a disk, which is not attached to the belly. Gill opening vertical, of moderate width, the gill membrane being united to the isthmus.

Chiefly Atlantic Coasts of America.

504. GOBIOSOMA GUTTULATUM, Macl.

Proc. Linn. Soc. N. S. Wales, Vol. II., p. 357, pl. 9, fig. 6.

Port Darwin.

Genus GOBIODON, Bleek.

Body oblong, more or less compressed, naked; head large, elevated; gill-openings of moderate width; generally two canine teeth near the symphysis of the lower jaw. Two dorsal fins; ventral fins united.

Coral Seas.

505. GOBIODON VERTICALIS, All. & Macl.

Proc. Linn. Soc. N. S. Wales, Vol. I., p. 333, pl. 12, fig. 4.

Darnley Island (Chevert Exp.), in coral.

506. GOBIODON CERAMENSIS, Bleek.

Gunth., Cat. Fishes III., p. 88.—Journ. Godeff., Heft. XIII., p. 182, pl. 109, f. D.

D. 6. 1/10. A. 1/9.

Height of body three times and a-half in the total length, the length of the head four times and a-half. Head compressed, as high as long; snout obtuse, convex, shorter than the eye. Lower jaw with small canine teeth. Dorsal fins much lower than the body; caudal rounded. Entirely black or brown, with black fins.

Darnley Island (Chevert Exp.)

507. GOBIODON CITRINUS, Rüpp.

Gunth., Cat. Fishes III., p. 87.—Journ. Mus. Godeff, Heft 13., pl. 109, fig. E.

D. 6. 1/10. A. 1/8.

Body short and compressed. Canine teeth none. Yellow; a blue black-edged streak along the base of the dorsal and anal fins; four transverse streaks of the same colour—two descending from the eye, the third from the vertex to the opercles, and the fourth in front of the pectoral fins.

Endeavour River (Macl. Mus.)

508. GOBIODON QUINQUESTRIGATUS, Cuv. & Val.

Gunth., Cat. Fishes III., p. 87.—Ann. and Mag. Nat. Hist. 1867, XX., p. 61.

D. 6. 1/10. A. 1/9.

Body short, compressed, its height being one-third of the total length; head as high as long, with the anterior profile parabolic. Ventrals short. Canine teeth. Yellow: head and thoracic region with five vermilion transverse bands; body with seven longitudinal series of spots of the same colour.

Cape York, (Gunther).

509. GOBIODON UNICOLOR, Castelnau.

Elleryia unicolor, Casteln., Proc. Zool. Soc., Vict., Vol. II., p. 95.

D. 6. 1/10. A. 10.

Height one-third of the total length. Head very convex and compressed, with very minute bony prominences between the eyes. Mouth very small and oblique; eye very small. Colour uniform pale yellowish-red, the fins sometimes very slightly darker; a broad purplish spot at the root of the pectorals.

Endeavour River. Cape Sidmouth.

Genus PERIOPHTHALMUS, Bl.

Body subcylindrical, covered with ctenoid scales of moderate size; head oblong with the cleft of the mouth nearly horizontal and with the upper jaw somewhat longer. Eyes very close together, very prominent, with the outer eyelid very well developed. Teeth conical, in both jaws vertical. Two dorsal fins; caudal with the lower margin obliquely truncated. Base of pectoral fin large, muscular and scaly. Ventrals more or less united. Gill-openings rather narrow; branchiostegals five; air-bladder absent; pseudobranchiæ rudimentary; a slit behind the fourth gill.

Low coasts and river mouths of tropical seas.

510. PERIOPHTHALMUS KOELREUTERI, Bl.

Gunth., Cat. Fishes III., p. 97.

B. 5. D. 10-16/12, A. 11. L. lat. 90-100. Vert. 11/15.

The second dorsal fin with a black, generally white-edged, longitudinal band on its upper half. The first dorsal not, or sometimes in young individuals, only slightly produced. About twenty teeth in each jaw. Ventrals separated from each other in adult and immature specimens.

Port Darwin. Katow. Torres Straits.

511. PERIOPHTHALMUS AUSTRALIS, Casteln.

Researches on the Fishes of Australia, p. 22.—Proc. Linn. Soc. N. S. Wales, Vol. III., p. 48.

"*The Climbing Fish*" of the Northern Queensland Settlers.

D. 3/12. A. 12. L, lat. about 50.

Height of body about five times in the length; head three three and two-thirds; eyes very prominent, nearly united; anterior profile of head vertical and bilobed; the superior portion of the upper prolongated into a free angular appendage, the lower portion very large and covering entirely the mouth; teeth composed of a series of canines apart from one another; teeth on the vomer and palate. Head scaly; the first dorsal fin narrow, high and filamentose; the distance between the two dorsals great; the ventrals are separate for more than half their length. General colour (in spirits) of a dark slaty-brown, with the lower parts brilliant yellow; the fins are fringed with yellow, and the anal is entirely of that colour.

Cape York. Port Darwin. Northern Coasts of Queensland. Attaining a length of 12 inches.

Genus ELEOTRIS, Gronov.

Body subcylindrical, scaly; head oblong; eyes of moderate size, lateral, not prominent. Teeth small. Two dorsal fins. Pectoral fins not very muscular at the base; ventrals not united, but near one another. Gill-openings of moderate width; five or six branchiostegals; air-bladder large; pseudobranchiæ; a slit behind the fourth gill. Anal papilla distinct.

Fresh-waters of all warm latitudes.

512. ELEOTRIS OPHIOCEPHALUS, Cuv. & Val.

Gunth., Cat. Fishes III., p. 107.—Journ. Mus. Godeff., Heft. XIII., p. 185, pl. 112, B.

D. 6. 1/8. A. 1/7. L. lat. 34-36. Vert. 12/14.

Twelve series of scales between the origin of the second dorsal fin and the anal. Head entirely scaly, excepting the front part of the snout; scales on the upper surface of head rather larger than those on the body. Height of body one-sixth of total length, the length of the head one-fourth. Head obtuse, flat, depressed.

The diameter of the eye is one-fifth of the length of the head, two-thirds of that of the snout; and four-ninths of the width of the interorbital space. The cleft of the mouth extends to below the middle of the eye. Teeth in villiform bands. Brownish, the scales with a rather darker centre; irregular series of pearl-coloured spots along the lower part of the sides; vertical fins with whitish margins, the second dorsal and caudal with light spots.

Rockingham Bay.

513. ELEOTRIS APOROS, Bleek.

Gunth., Cat. Fishes III., p. 109.—Ann. and Mag. Nat. Hist., 1867, XX., p. 62.

Eleotris macrolepidota, Bl., Gunth., Cat. Fishes III., 111.—Journ. Mus. Godeff., V., pl. 112.

D. 6. 1/8. A. 1/8-9. L. lat. 32-38. Vert. 12/13.

Ten or eleven series of scales behind the origin of the second dorsal fin and the anal. Head entirely scaly, excepting the front of the snout; scales on the upper part rather larger than those on the body. Scales minutely ciliated. Height of body is from four to five times in the total length, the length of the head four times. Head obtuse, flat, depressed. The eye occupies the third-seventh of the length of the head, and is one-third of the width of the interorbital space, (in adult specimens). The maxillary extends to the vertical from the anterior margin of the eye. Brownish-olive (in spirits), with one or two rows of darker spots along the side; three oblique streaks from the eye to the opercles, the upper leaving a spot on the base of the pectoral. Fins blackish, the second dorsal and anal with white margin.

Port Denison. Cape York (Gunther).

514. ELEOTRIS DARWINIENSIS, Macl.

Agonostoma darwiniense, Macl. Proc. Linn. Soc. N. S. Wales, Vol. II., p. 360, pl. 9, fig. 8.

Port Darwin.

515. ELEOTRIS MOGURNDA, Richards.

Voy. Erebus and Terror, Fishes, p. 4, pl. 2, figs. 1—2.—Gunth., Cat. Fishes III., p. 111.

D. 8. 1/12-13. A. 1/13. L. lat. 48.

Fifteen series of scales between the origin of the second dorsal fin and the anal. Scales of head and body equal, minutely ciliated. Height of body five times in the total length, the length of the head three times and three-quarters. The horizontal diameter of the eye is one-sixth of the length of the head, and one-half the width of the interorbital space. Snout moderate, rather depressed, with the lower jaw prominent; the maxillary extends nearly to the vertical from the anterior margin of the eye. Teeth villiform in broad bands. Pale brown (in spirits) with a series of dark-brown spots along the middle of the side; three oblique, narrow brown stripes from the eye to the gill-opening, the upper one reaching on the base of the pectoral fin.

Port Essington.

516. ELEOTRIS AUSTRALIS, Krefft.

Proc. Zool. Soc., London, 1864, p. 183.

D. 7. 1/8. A. 1/8. L. lat. 32.

Eight series of scales between the origin of the second dorsal fin and the anal. Head scaly as far as the snout, obtuse; lower jaw prominent; teeth in villiform bands. The height of the body is four times and a-half in the total length, the length of the head four times and a-quarter; tne horizontal diameter of the eye one-half the width of the interorbital space. Colour yellowish brown, covered with minute, black spots, which form five or six longitudinal lines upon the sides; base of pectoral fins with a narrow, bright yellow band; all the rays of the caudal spotted with black; second dorsal with three or four narrow, sometimes indistinct bands. Anal papilla as long as the horizontal diameter of the eye, and nearly as broad. Length five inches.

Rivers and Creeks of East Coast of New South Wales.

517. ELEOTRIS COXII, Krefft.

Proc. Zool. Soc., London, 1864, p. 183.

D. 7. 1/9. A. 1/9. L. lat. 36-38.

Twelve series of scales between the origin of the second dorsal fin and the anal. Head scaly, snout obtuse, with the lower jaw prominent. The height of the body is five times and a-quarter in the total length; the length of the head more than four times; the horizontal diameter of the eye is one-fourth of the length of the head, and equal to the width of the interorbital space. Bright yellow: upper part and sides finely punctured with black, forming a broad, sometimes indistinct streak upon the sides; dorsals and pectorals bright yellow at the base, the first punctured with black: the belly whitish. Teeth viliform, in broad bands. Anal papilla large, somewhat longer than broad. Length five and a-quarter inches.

Ropes' Creek, Mulgoa, upper Hawkesbury River.

518. ELEOTRIS GRANDICEPS, Krefft.

Proc. Linn. Soc., London, 1864, p. 183.

D. 7. 1/9. A. 1/9. L. lat. 38-40.

Twelve series of scales between the origin of the second dorsal fin and the anal, Head very large, broad, depressed, without scales; lower jaw prominent; teeth villiform. The height of the body is five times in the total length, the length of the head three times and a half. The diameter of the eye is one-fifth of the length of the head, and nearly half the width of the interorbital space; the pectorals reach to the origin of the anal fin. General coloration yellowish, punctured with black, in particular on the upper part and sides; snout blackish; lower jaw sometimes punctured with black also; beneath whitish. Anal papilla very small. Length three and a-half inches.

Upper Hawkesbury. Eastern Creek, Bronte.

519. ELEOTRIS COMPRESSUS, Krefft.

Proc. Zool. Soc., London 1864, p. 184.

D. 1/9-10 A. 1/10. L. lat. 28-30.

Eight series of scales between the origin of the second dorsal fin and the anal. Body cyprinoid, compressed; the height three times and three-quarters in the total length, the length of the head four times; the horizontal diameter of the eye is one-fourth of the length of the head, and is contained once and a-half in the width of the interorbital space; the snout is short, lower jaw longest; mouth rather small; head scaly. Coloration reddish-brown, with five or six indistinct cross-bands formed of close-dotted black spots with which the scales are covered. The second dorsal and anal fins are rather long, and more or less marked with black at the base and top, the hinder part of the second dorsal is also speckled with white. Anal papilla of moderate size and forked.

Clarence River. Port Denison. Length three and a-half inches.

520. ELEOTRIS NUDICEPS, Casteln.

Proc. Zool. Soc., Victoria, Vol. I., p. 126.

D. 7. 1/10. A. 1/10. L. lat. 47.

Height of body six times in the total length, head three and one-fourth times; eye six times and one third in the length of the head; lower jaw considerably longer than the upper; head very large, very broad, being at its widest part one-half its length. Mouth very broad; the maxillary extends to below the centre of the eye, the eyes about one third of the length of the head apart. The teeth are numerous and cardiform, those of the lower jaw larger; teeth on the vomer and palatines and back part of the tongue. Head naked, but rough and with longitudinal ridges. Scales on anterior part of body very small. The last ray of the dorsal fin longer than the others; caudal fin long and rounded; pectorals two-thirds as long as the head and of eighteen rays.

Colour light olive-green, whitish beneath; head nearly black; the first dorsal fin has two longitudinal bands of red spots, the second has three or four of the same; the caudal has numerous transverse series of small red spots; ventrals and anal white.

Yarra River.

521. ELEOTRIS MODESTA, Casteln.

Proc. Zool. Soc., Victoria, Vol. II., p. 85.

D. 6. 1/8. A. 1/9. L. lat. 31. L. transv. 11.

Elongate; height of body four times and four-fifths in the total length; length of head three times and a-half; eye three times in the length of the head. The snout is shorter than the diameter of the eye, rather depressed, but not very broad; the cleft of the mouth is oblique, and does not reach to the vertical from the anterior edge of the orbit; head entirely scaly; scales of body large, striated and finely serrated. The first dorsal fin somewhat produced into filaments. Colour light yellow, with the upper parts rather brown; a very small and obscure spot at the upper angle of the base of the pectorals, and a dark faint line along the body to the tail. The dorsal fins are marked with irregular, oblique, transverse spots, and the extremity of the second is black; the caudal is transversely speckled with brown.

Port Darwin (Castelnau). Under two inches in length.

522. ELEOTRIS CASTELNAUI, Macl.

**Eleotris obscura*, Casteln., Proc. Zool Soc., Vict., Vol. II., p. 134.

D. 9?/9. A. 8. L. lat. 37-38. L. transv. 11.

Head large and broad, its length being four times in the total length; the space between the eyes is four times and two-thirds in the length of the head; the widest diameter of the orbit is one-sixth of the total length; head naked, some elevated lines on the præoperculum. The lower jaw is longer than the upper; the teeth are small and disposed in numerous rows; the throat is much inflated; the cleft of the mouth is rather oblique; the scales are striated and ciliated. The second dorsal and anal fins are rather high, the caudal is elongate, rounded, and five times in the total length. Colour dark brown (in spirits). Length three inches.

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*Name appropriated before by Schlegel, for a Japanese species.

Swan River (Castelnau).

523. ELEOTRIS PALLIDA, Casteln.

Researches on the Fishes of Australia, p. 24.

D. 7/ . A. L. lat. 32.

Height of body three times and three-fourths in the total length (without caudal); length of head three times. Lower jaw much longer than upper; eyes small; scales large. Colour olive-yellow, a very faint blotch at the root of the tail; head with three faint, obscure, oblique bands from the eye to the opercle; fins transparent, caudal with transverse lines of black dots.

Cape York (Castelnau). Length three and a-half inches.

524. ELEOTRIS SIMPLEX, Casteln.

Proc. Linn. Soc. N.S. Wales, Vol. III., p. 49.

Norman River.

525. ELEOTRIS PLANICEPS, Casteln.

Proc. Linn. Soc. N. S. Wales, Vol. III., p. 49.

Norman River.

526. ELEOTRIS SULCATICOLLIS, Casteln.

Proc. Linn. Soc. N.S. Wales, Vol. III., p. 142.

Brisbane River.

527. ELEOTRIS ADSPERSA, Casteln.

Proc. Linn. Soc. N. S. Wales, Vol. III, p. 142.

Fitzroy River.

528. ELEOTRIS OXYCEPHALA, Schleg.

Gunth., Cat. Fishes III., p. 115.—Kner., Voy. Nov., Fishes, p. 185.

D. 6. 1/8. A. 1/8. L. lat. 48.

Præoperculum with a spine directed forwards. Thirteen series of scales between the origin of the second dorsal fin and the anal. The scales on the head are small and extend on to the snout; those on the cheeks are minute. Scales minutely ciliated. The height of the body is one-sixth of the total length, the length of the head one-fourth. The eye occupies the third eighth of the length of the head, and is one-third of the width of the interorbital space. Snout depressed, of moderate length, with the lower jaw prominent; the maxillary does not quite reach the vertical from the centre of the eye; teeth villiform forming bands. Brownish, with scattered darker dots and lighter stripes along the series of scales; the lower parts minutely dotted with brown and the lower part of the head with round white spots. Fins with serrated brown bands. Length four to six inches.

Sydney (Kner).

529. ELEOTRIS ELEVATA, Macl.

**Eleotris compressus*, Macl., Proc. Linn. Soc. N. S. Wales, Vol. II., p. 358, pl. 9, fig. 7.

Port Darwin.

530. ELEOTRIS MASTERSII, *n. sp.*

D. 7. 1/8. A. 9. L. lat. 38.

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*Name previously used by Krefft.

Ten series of scales between the origin of the second dorsal fin and the anal. Height of body one-seventh of the total length; the length of the head one-fourth. Head flat; snout longer than the eye; lips thick; lower jaw projecting; mouth oblique, not reaching to the vertical from the anterior margin of the eye; distance between the eyes more than their diameter. Scales rather large, ciliated and some striated, extending on the top of the head as far as the eyes; fins large, caudal rounded; anal papilla broad and flat. Colour in spirits, yellowish-brown, with round brown spots on the cheeks and upper part of the sides of the body. Fins yellow: the dorsals spotted with brown, in about three longitudinal series, the caudal minutely spotted with brown on the rays in about eight transverse series.

Ropes' Creek (Macl. Mus.)

531. ELEOTRIS LINEATA, Casteln.

Researches on the Fishes of Australia, p. 24.

D. 7/14. A. 14. L. lat. over 70.

Head three times and a-quarter in the length without the caudal fin. Body elongate; caudal fin pointed; the fourth ray of the first dorsal elongate, the third slightly so. Colour a light lilac-grey; a longitudinal pink stripe, narrowly bordered with black, runs along the middle of the body, three similar stripes run on the head and opercles below the eye; the first dorsal fin is also spotted in the same way, and the elongated ray is black; an obscure spot at the base of the caudal.

Cape York. Darnley Island (Chevert Exp.)

532. ELEOTRIS FUSCA, Bl.

Gunth., Cat. Fishes III., p. 125.—Ann. and Mag. Nat. Hist., 1867, XX., p. 62.

D. 6. 1/8. A. 1/8. L. lat. 60-65. Vert. 11/14.

Præoperculum with a spine directed downwards. Sixteen series of scales between the origin of the second dorsal fin and the anal. Scales on top of the head small, extending to the space between the eyes; those on the cheeks minute. Scales ciliated. Height of body one-fifth of the length, length of head one-fourth. The eye occupies the third seventh of the length of the head and its vertical diameter is one-third of the width of the interorbital space. Snout depressed, short, with the lower jaw prominent, the maxillary reaches to the vertical from the centre of the eye. Teeth villiform forming bands, those of the outer series enlarged of rather unequal size. Blackish-brown: the lateral scales sometimes with black centre; the spots forming either more or less regular longitudinal series, or a band along the middle of the side; dorsal and caudal fins with distinct, anal and pectoral with rather indistinct, series of brown dots.

Australia (Gunth.)

533. ELEOTRIS MURALIS, Cuv. & Val.

Gunth., Cat. Fishes III., p. 130.—Ann. and Mag. Nat. Hist., 1867, XX., p. 62.

B. 5. D. 6. 1/12. A. 1/12. L. lat. 80.

The second, third, and fourth dorsal spines produced into filaments. The height of the body is one-eighth or one-ninth of the total length, the width of the interorbital space is one-half of the diameter of the eye; teeth in single series of unequal size. Brownish: head and body with red longitudinal bands; back with some irregular cross-bands. Fins yellow: the first dorsal with a black spot behind the top of the third spine; dorsal and anal fins with red longitudinal bands, caudal with red and brown spots.

Cape York. Darnley Island. Endeavour River.

534. ELEOTRIS TÆNIURA, *n. sp.*

D. 6. 1/11. A. 11.

Scales very small. Height of body one-sixth of the length, length of head one-fifth. Snout convex, longer than the eye, which is equal to the width of the interorbital space. Mouth horizontal, reaching to below the middle of the eye; teeth cardiform. The last ray of the second dorsal fin extends to the caudal, and the central rays of the caudal are elongated very considerably. Colour in spirit, brownish-yellow, with three bands as in *muralis*, on the sides of the head, and five or six large transversely oblong, brownish spots along the middle of the side; there are traces also of ocellated spots on the opercles. Fins immaculate, yellow.

Low Island, Barrier Reef.

535. ELEOTRIS ELONGATA, All. & Macl.

Proc. Linn. Soc. N. S. Wales, Vol. I., p. 334, pl. 13, fig. 1.

Darnley Island.

Genus ARISTEUS, Castelnau.

Proc. Linn. Soc., N. S. Wales, Vol. III., p. 141.

Freshwaters of Australia.

536. ARISTEUS FITZROYENSIS, Castelnau.

Proc. Linn. Soc. N. S. Wales, Vol. III., p. 141.

Fitzroy River.

537. ARISTEUS FLUVIATILIS, Casteln.

Proc. Linn. Soc. N.S. Wales, Vol. III., p. 141.

Murrumbidgee River. Ropes' Creek.

538. ARISTEUS RUFESCENS, *n. sp.*

D. 1/5 1/9. A. 1/20. L. lat. 30.

More elongate than the two foregoing species, the height of the body being less than a-third of the length (without the caudal); space between the eyes very flat, and smooth, about the width of two diameters of the eye; mouth small, the intermaxillary roundly enlarged in front, making the cleft of the mouth horizontal in the middle and oblique on each side; præoperculum very short with a straight posterior edge; teeth numerous on the edge of the maxillary and mandibulary bones and on the vomer; the spine of both dorsal fins strong, as also of the anal; the rays of the first dorsal filamentary, tail slightly emarginate; ventrals short, near the anus; anal papilla none or very small. Colour reddish chestnut, with a very thin, sometimes inconspicuous black line along each side of the body. Fins immaculate.

Rivers of Northern Queensland.

539. ARISTEUS LINEATUS, *n. sp.*

D. 1/4 1/11. A. 18. L. lat. 30.

The same very compressed form as *A. Fitzroyensis*, mouth, head and eye also almost the same, height of body one-third of length without the caudal fin. Scales cycloid, larger behind than in front; the rays of the dorsal fins mostly ending in filaments, but not much prolonged; caudal fin rather long, emarginate. Silvery: with a broad blackish band along the middle of each side, with faint traces of a similar band on the back and belly; the dorsal, caudal, and pectoral fins faintly marked with black; the ventrals with the outer ray and the anal with the margin, deep black; the membranes of both of a carmine red tinge.

Richmond River. Length three inches.

Genus CALLIONYMUS, L.

Head and anterior part of the body depressed, the rest subcylindrical, naked. Head triangular, with the cleft of the mouth narrow, horizontal, and with the upper jaw very protractile. Eyes of moderate size, more or less directed upwards. Teeth very small, palate smooth. A strong spine at the angle of the præoperculum. Two dorsal fins, the anterior with three or four flexible spines; ventrals five-rayed, widely apart from each other. Gill-openings very narrow, generally reduced to a foramen on the upper side of the operculum; branchiostegals six; air-bladder none; pseudobranchiæ; a slit behind the fourth gill.

Fishes of nearly all seas, living on the bottom near the shore.

540. CALLIONYMUS CALAUROPOMUS, Richards.

Voy. Erebus and Terror, Fishes, p. 10, pl. 7, f. 4-5.—Gunth., Cat. Fishes III., p. 147.

D. 4/8. A. 7. C. 10.

Branchial foramen large, immediately above the extremity of the operculum; præopercular spine bifid and curved upwards at the apex. Dorsal fins not elevated; lateral line wavy; the middle rays of the caudal fin very elongate in the male. Bronze-coloured (in spirits), clouded with darker, dorsal fins spotted,

North-west Australia. Port Jackson. Port Phillip.

541. CALLIONYMUS PAPILIO, Gunth.

Ann. and Mag. Nat. Hist., 1864, Vol. XIV., p. 197.

Callionymus ocellifer, Casteln., Proc. Zool. Soc., Victoria, II., p. 49.

D. 4/7. A. 6. C. 11.

Præopercular spine considerably shorter than the head, bifid at its extremity, both points directed upwards. The rays of the vertical fins long, those of the second dorsal longer than those of the first, and nearly equal in length to the middle caudal rays, which are not quite half as long as the body; the last anal ray prolonged. The ventral fin extends beyond the origin of the anal. Body light brownish marbled with darker; the lower part of the sides of the trunk and tail with numerous pearl-coloured vertical lines; belly pearl-coloured. Sides of the head with numerous small white ocelli, edged with violet. Both dorsal fins with large, irregular, rounded, whitish spots, each with a narrow violet edge; there are fine white dark edged lines and dots within the large spots; a narrow black, blue edged spot behind the the extremity of the first dorsal spine. Caudal and pectoral fins with white dots, which are mixed with brown ones on the lower half of the caudal. Oblique pearl coloured lines behind each anal ray.

Melbourne.

542. CALLIONYMUS CALCARATUS, *n. sp.*

D. 4/9. A. 8. C. 10.

Branchial foramen transversely oval, about as far apart as each is distant from the præopercular spine and much in advance of the first dorsal fin. Head very flat; eyes close together; snout rather truncately pointed; præopercular spine longer than the longest diameter of the eye, strong, flat, with a strong spur on the posterior half of the outer side pointing backwards, and three on the inner side pointing inwards and backwards. Lateral line wavy. Last dorsal ray somewhat prolonged. Tail elongate, pointed. Colour cinerous, speckled and marbled faintly with reddish-brown, yellow beneath; the first dorsal fin hyaline with a large, irregular, black or cyaneous blotch in the centre, the second dorsal and caudal distantly spotted with brown. Ventrals and the rays of the anal blackish. Length seven inches.

Port Jackson.

543. CALLIONYMUS LATERALIS, *n. sp.*

D. 4/8. A. 8.

Branchial foramen small, opening over the operculum only a little in advance of the first dorsal fin. Head rather flat, eyes close together, their diameter rather longer than the snout, which is rounded and narrowed in front. Præopercular spine scarcely as long as the diameter of the eye, strong, rather flat, curved backwards and upwards into an acute spine at its extremity and with a broad, triangular, flat, spine on the inner side near the apex. Caudal fin pointed and rather long; ventrals large, reaching the second anal ray. Colour yellowish or reddish-yellow; minutely dotted with white, and with many indistinct ocellated spots; a line of about a dozen pearl-white, roundish spots along the side of the abdomen under the lateral line, which is extremely crooked. The first dorsal fin barred with blackish, the second and caudal spotted, the anal blackish. Under three inches in length.

Port Jackson.

NOTES AND EXHIBITS.

Mr. Brazier exhibited many specimens of a *Filaria* taken from imported Salt Herrings.

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WEDNESDAY, DECEMBER 29TH, 1880.

W. J. Stephens, Esq., M.A., Vice President, in the Chair.

DONATIONS.

Proceedings Royal Microscopical Society, Vol. III., parts 4—5, from the Society.

Eucalyptographia, Decade VII., from Baron F. von Muller, K.C.M.G., etc.

Palæontology of New Zealand, Part IV.

Monograph of Strombid Del. Mar. Rossa, 1876, by Issel and Tapparone Canefri.—Pars III. and IV., Contribuzioni per una Fauna Malacologique delle isole Papuane, by T. Canefri, 1876-77. —Intorno ad Alcune Specie di Testacei Marini mal conoscuite o nuove dell' Isola Maurizie, T. Canefri, 1877.—Museum Pauluccianum, Etudes Malocologiques, T. Canefri, 1879, from Mr. Brazier.

PAPERS READ.

REMARKS ON SOME RECENTLY REDESCRIBED AUSTRALIAN SHELLS.

BY J. BRAZIER, C.M.Z.S., &c.

1. ALEXIA MERIDIONALIS.

1877.—*Auricula (Alexia) meridionalis*, Brazier, Proc. Linn. Soc., New South Wales, Vol. II., p. 26.

1878.—*Alexia meridionalis*, Angas, (Brazier, MSS.) Proc. Zool. Soc., p. 869.

Hab. Port Adelaide Creek, South Australia.

This species was fully described by me at the time I received it in 1877 from Mr. Bednall, therefore I never gave it a MS. name.

2. MUREX (PTERONOTUS) BEDNALLI.

1877.—*Murex (Pteronotus) Bednalli*, Brazier, Proc. Linn. Soc., New South Wales, Vol. II., p. 6.

1880.—Tryon, Manual of Conchology, Vol. II., p. 262.

1880.—*Murex (Pteronotus) bednalli*, Angas, Proc. Zool., p. 418, pl. xl., fig. 2.

Hab. Port Darwin, North Coast of Australia.

Mr. Angas remarks on this species "discovered by Mr. Bednall and provisionally named by Mr. Brazier, which I have great pleasure in figuring in the Society's Proceedings."

What Mr. Angas means by saying that this species was provisionally named by me I am at a loss to conjecture. The species was named by me *Bednalli*, and fully described in the Proceedings of this Society on the 29th January, 1877, and Mr. Angas has the coolness to redescribe it without acknowledgement, in the

Proceedings of the Zoological Society of London, on the 4th of May, 1880.

3. VOLUTA BEDNALLI.

1878.—*Voluta Bednalli*, Brazier, Proc. Linn. Soc. N. S. Wales, Vol. III., p. 81, pl. viii., fig. 3.

1880.—*Voluta (Aulica) bednalli*, Angas. Proc. Zool. Soc., p. 418, pl. xl., fig. 1.

Hab. Port Darwin, North Coast of Australia.

A very good uncoloured figure was given of this species when first described by me.

Mr. Angas, remarks on this species, "Mr. Brazier, of Sydney has already bestowed on this beautiful shell the name of its discoverer, Mr. W. T. Bednall; and I have much pleasure in retaining that name, and figuring it in the Proceedings of the Zoological Society of London." I do not think that Mr. Angas had any option in the matter of retaining the name, when I had described, figured, and named it in the published Proceedings of this Society two years previously.

ON A NEW SPECIES OF *Regalæcus*, FROM PORT JACKSON.

By E. P. Ramsay, F.L.S., &c.

REGALÆCUS JACKSONENSIS, *sp. nov.*

[Plate XX.]

The first five to seven spines of the dorsal fin detached, slender, very small and hair-like; they begin opposite the upper angle of the gill-cover; to opposite the vent are 75 rays, here they are longest and about one-third the height of the body. Pectoral rays 14, the first very small and short. Ventrals represented by a short, slender tubercle on either side of a small triangular space opposite the posterior base of the pectoral; pectorals small, falcate. The height of the body at the vent is four and a-half times in the distance from the snout; length of the head four and a-quarter to the vent; the height of the head from the first dorsal ray is less than the length; the diameter of the eye three and a-half in the length of the head. Greatest width of body half way between snout and vent; about seventy plates on the lateral line to opposite the vent, an oblique line from between the seventy-seventh and seventy-eighth ray, reaches to the seventieth plate; the plates form rounded tubercles over the angle of the operculum, and lengthen as they approach the tail, where they become oblong-linear in shape, all plates on the lateral line have a small recurved spine directed backwards and situated on the centre of each plate, these spines are largest on the caudal plates. Above the lateral line osseous scutæ form oblique bands from the interspaces of the rays, and reach half way down to the lateral line, the remainder of the scutes are roundish or somewhat hexagonal, those on the abdominal line are conical pointed and directed forwards. The length of the head, when the snout is not produced is less than the height of the body. The membrane between the dorsal rays is not attached to the back, but only at the base of each ray. There are four teeth on either side of the lower jaw, conical, not strong; ·and five teeth on either side of the upper jaw. General colour of burnished silver, a blackish line along the base of the dorsal spines, down the snout and extending on to the chin; eye large, resembling a flattened disc of quicksilver. Total length of the specimen (the end of the tail wanting) is four feet eight inches, greatest height seven inches, the head six and a-half, pectoral fin three and a-half.

This specimen was speared by Mr. Frederick Johnston, at Manly Beach, in November last, and presented to the Museum by that gentleman. I believe it is the first specimen of this rare genus that has been obtained on the New South Wales coast.

It differs from all described species in having the dorsal rays on the forehead reduced into weak, short, hair-like spines—there is only a very short space between the detached anterior portion of the dorsal rays and the rest of the fin.

The total length of this specimen restored would be about six feet, the width about one inch, and the height seven inches without the fin. Colour uniform, of burnished silver, no markings or spots on the body, fin membranes opalescent, longest rays about a-quarter of the height of the body.

NOTES ON SOME OF THE HABITS AND CUSTOMS OF AUSTRALIAN NATIVES IN QUEENSLAND.

BY DR. J. C. COX, F.L.S.

The Natives of Australia are so rapidly disappearing, owing to their altered habits and the evil influences which accompany civilization, and so little is recorded of those habits, that any authenticated facts regarding them are worthy of note; I crave no apology therefore for offering the few brief notes to this Society which I have made regarding some of the tribes to the North of Queensland.

It has been known for a considerable time that the male members of some of the Native tribes which inhabit the North-west part of Australia, and a few tribes also which inhabit that part of the Continent to the North-west of Fort Bourke have an operation performed on their genital organs when about ten or twelve years of age, the object of which it is difficult to surmise. The operation which I refer to is that of having their urethras slit up from the posterior part of the meatus at the point of the glans along the median line of the under surface of the penis as far back as the scrotum. My friend Mr. Sydney Brown was the first to call my attention to this curious custom, having observed it amongst the tribes North-west of Fort Bourke, who gather and use the narcotic plant known as *Pitchurie;* before being able to make observations for himself, he had heard of this practice, but it was described to him as a process of circumcision; he soon, however, convinced himself when he had an opportunity, that such was not the case, but that it consisted of the more formidable operation mentioned. Mr. Brown is fully of opinion that amongst the tribes he visited certain members of them were left unoperated on. Since being informed of this custom by Mr. Brown, I have had sent to me a very interesting pamphlet written by Dr. Richardson, who gives a minute account of this operation as practised by the Natives in North-west Australia, making them in reality Hypospodiacs.

Mr. Henry Bloomfield, while residing at Fort Constantine Station on the Cloncurry River, District of Bourke, 270 miles south of Normanton on the Gulf of Carpentaria, and about 570 miles west of Townsville, observed that many of the Natives residing there had been subjected to an operation of the same kind, but that the custom was not at all universal. The Natives however, which inhabit the heads of the Cloncurry have all been subjected to this operation, and the same was found to be universal amongst the natives which inhabit the MacKinlay Range and the watershed, from thence west, except the tribes known as the Calcadoon, Edgiree, Rinooringoo, and Yallunga, and possibly others. Mr. Bloomfield has no doubt that every one of the males of these tribes have had this operation performed on them, and that none of them have been left intact, as is generally affirmed by persons who have been out in the districts where these tribes reside—the term Bucks has been applied to those of the males of these tribes who are supposed to have been left perfect—from information obtained by personal inquiry Mr. Bloomfield made himself sure that any Natives amongst these tribes not operated on were only visitors from other tribes from a distance, residing with them only temporarily. This operation of splitting up the urethra is done with a sharp flint, about the age of puberty or at any rate before the young men of the tribes are permitted to take gins. It was supposed by many who had seen them, that these Natives had been circumcised, but such is not the case, the prepuce being cut shrinks back as the wound heals by cicatrization along the slit up urethra. It is asserted by some of the white settlers of this district that many of the gins undergo some operation to prevent them bearing children, but as far as Mr. Bloomfield's observations went, he saw nothing to corroborate this supposition; they undergo however an operation by which the nipples are cut off the breasts, with what object it is difficult to conjecture, but there seems good reason to believe that the children born from such mothers are all given up for food to the tribe; all these tribes were found to be undoubted cannibals, possibly from necessity, as there is great difficulty in their being able to procure much flesh of any kind, opossums and kangaroo are scarce; their principal food being rats, lizards, snakes, birds, mussels, and roots. The Calcadoon and Mithure tribes use spears with and without barbs, made of hard wood, but not so stout as spears found with other Natives, and they are thrown with a Womera; they use also a Boomerang of a short kind with equally bent ends, but their principal way of capturing the stronger kinds of game is by very long nets, made from thick cord twisted by hand out of the bark of a shrub; the seed of the grass is collected by thrashing, and it is then rubbed into a flour on a stone and made into cakes. The stone tomahawk and flint knife are the only cutting implements found amongst them. It is an interesting fact that all these tribes were found in possession of what is known as *Pitchurie* as it is not known to grow in the district, but they did not smoke it, as Mr. Brown observed them on the North-west of Fort Bourke, but chew it alone, a quid of it was passed round from one to another to chew, and when tired of it it is plastered behind the ears.

The gins of the Calcadoon tribe had the two front teeth always knocked out, and both men and women have their noses perforated and are tattood—they make their dilly bags generally of human hair. They use snares of a peculiar kind for the capture of the wild turkey, these snares are about eighteen inches long, one end stiff and strong, made by twisting the feathers from the wing of the turkey, the other end is limp and has a loop made of human hair, these snares are tied on to the end of a spear and held just above the grass by a native who creeps up to his prey disguised by fresh boughs tied round his head, and the bird being naturally a stupid, inquisitive one comes to examine this object and permits itself to be snared.

NOTES AND EXHIBITS.

Dr. Cox stated that he had been requested by Mr. Henry Bloomfield to have the following facts published in regard to a report which had gone the rounds of the daily papers in reference to a statement said to have been made by Mr. Skuthorpe, to the effect that half-caste natives had been seen by him amongst the tribes of natives on the Herbert River, in the North of Queensland. He thought he could no do better than communicate those facts through this Society. Mr. Bloomfield has been residing for many months on the Port Constane Station, on the Cloncurry River, district of Bourke, Queensland, about 270 miles south of Normanton, on the Gulf of Carpentaria, and about 570 miles west of Townsville. He received the following information from Mr. Thomas Cribb, who was with Mr. H. Skuthorpe on the Herbert River five years ago next January, and was with him all the time Mr. Skuthorpe was out there. Mr. Cribb states that Mr. Skuthorpe had gone inside where Mr. Kirwin perished in endeavouring to get to the Diamantina, and that there is not the slightest foundation for the statement that half-caste natives had been seen by them amongst the tribes of the Herbert. No mention was ever made to Mr. Cribb of the presence of these half-castes during the whole time they resided together on the Herbert. The names of the three tribes are Edgiree, Wanditta, and Yalulunga. All these tribes are said to be circumcised, but they are not. They have all undergone an operation, causing hypospadias, which gives the appearance of circumcision. Mr. Cribb has resided on the Herbert River and in the vicinity where Mr. Skuthorpe was for the last few years, and has not only not seen any half-caste amongst the tribes there, but has never heard it mentioned that any did exist. These half-castes, said to have been seen by Mr. Skuthorpe, were supposed by him, it is said, to be children of Classen, who was one of Leichhardt's party.

Mr. Cribb expects to be in Sydney in January, 1881, and can be heard of at Sullivan and Simpson's office, Stock and Station Agents. Mr. Thomas Cribb recommends those interested in this matter to apply to Mr. Edkins, Mount Cornish Station, Bowen Downs; also to Mr. Johnstone, Manan Downs: and to Mr. Nat. Powell, jun., of Bungendore.

Mr. Brazier exhibited *Helix Goldei*, and *H. Hundsteini* from New Guinea; Tryon's Manual of Conchology parts VI. to VIII., completing Vol. II., with *Muricinæ* and *Purpurinæ;* also three species of Australian Sea Birds, viz., *Nectris carneipes*, *Prion Turtur*, and *Pelagodroma fregata*. He stated that the beach at Bondi, and other beaches along the coast both north and south of Sydney were strewn with the bodies of these and other sea birds.

Dr. Cox exhibited three Stone Axe-heads, a snare for catching Bustards and some other articles of Aboriginal manufacture and use from the Cloncurry River.

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ANNUAL GENERAL MEETING, JANUARY 27TH, 1881.

W. J. Stephens, Esq., M.A., Vice-President, in the Chair.

Dr. Alexandri of the University of Pisa, and Mr. Whittle, were introduced as visitors.

PRESIDENT'S ADDRESS.

On behalf of the President, the Vice-President read the following address :—The time has again come round when the duty devolves upon me to deliver the Annual Address to the members of this Society. In doing so, I must first congratulate you on its steady and substantial progress. During the past year we have issued a volume which will bear comparison with any scientific serial for the extent and importance of the matter contained. It has been most favourably received by the colonial Press, and many letters from scientific friends in Europe bear testimony to the high estimation in which our publication is held. The volume for the past year will, I am sure, be equal in interest to the last. The numbers of our members are also on the increase. Our exchanges with other Societies have augmented to that extent that we see the necessity of having rooms and a library of our own; and when that is effected we shall receive valuable aid from some of our members who have already promised donations of books. The attendance at our meetings has been increased. It is not at any time numerous, but in this particular we must not expect a different result from what is experienced by learned Societies in Europe. Proportionably the attendance is small in all those meetings where purely technical science is dealt with. We do not professs to give popular lectures. Our object is the advancement of Natural History by original investigations. We deal with the dry technicalities of scientific diagnosis, and seldom is our knowledge of facts sufficient in Australia to enable us to wander into the more interesting field of generalisation or theoretic speculation. Thus we cannot expect to have around us more than the few who have mastered the language of Science, or who have gone far enough with observation to appreciate the careful investigations of others. It is to be regretted that the number of these is so few. But we hope to see a growing taste for these pursuits, and there is evidence of it. There are few men who do not share the regret of Thomas Carlisle, who, in one of his works, plaintively exclaims :—" For many years it has been one of my constant regrets that no schoolmaster of mine had a knowledge of Natural History, so far, at least, as to have taught me the grasses that grow by the wayside, and the little winged or wingless neighbours that are continually meeting me with salutation that I cannot answer as things are." Even a moderate knowledge of Natural History makes nature such a living book that all the pleasures of the mind become manifoldly increased. The learned J. Stuart Mill, when philosophy had landed him upon a cold dull pyrrhonism, said that once curiosity was satisfied life was not worth having. Had he been a little of a Naturalist I think he would scarcely have felt this, for curiosity is never satisfied in this domain of knowledge. Each step in advance increases the prospect of fields beautiful and new, and the voice of nature is ever living. To use the idea of Macaulay, we may say it is a philosophy which never rests. " That which was in the distance yesterday is its goal to-day, and will be its starting-place to-morrow."

The retrospect over the progress of our little Society brings me to a subject which forces itself very much upon my mind on this occasion, and that is the general progress of scientific investigation in the Australian Colonies within the last few years. The time has not yet come when anything like a history of our advancement in this respect can be attempted. We can, however, make comparisons which will show us how original thought and investigation have gone on amongst us. Australia has had singular advantages in its scientific history. Some of the most eminent names on the roll of fame have been first known through what they did on Australian shores. Sir Joseph Banks, Robert Brown, Sir Joseph Hooker, Gould, Jukes, Swainson, and many others are instances of this. I reserve for separate mention the illustrious author of the 'Horæ Entomologicæ,' Mr. William Sharp Macleay. At a time when the natural sciences were almost in their infancy it is with satisfaction and just pride we read the name of this illustrious Naturalist so often quoted. His reputation was world-wide and his investigations all stamped with the mark not only of genius, but with that accuracy and caution which alone give a permanent foundation to scientific fame. All that he acquired—and it was much—will always be associated with Port Jackson, the oft-quoted scene of his labours. We may say that he was truly the pioneer of Natural Science in Australia. just as Sir Thomas Brisbane was the pioneer of Australian Astronomy and Meteorology, and the Rev. W. B. Clarke the father of Australian Geology.

But while the East Coast of Australia thus received its share and more than its share of attention, the South and West, the Centre and the North, were comparatively neglected. This was unfortunate in many ways. Great as the interest is which attaches itself to any portion of our continent, yet the East Coast possesses these novel features in the least degree. The reason of this is that the East Coast shares its peculiarities with other and often well-known provinces. Thus, on the North Coast, there is a large intermixture of the Asiatic element. Some of the plants have been known since the days of the Portuguese navigators. Its molluscan fauna is almost entirely Indian or Philippine. These characters are less marked as the coast is followed to the Southward, but then they become mingled with some belonging to the Pacific Islands, New Zealand, &c. But the South Coast is in every respect Australian. Its flora has few foreigners, and its fauna, whether marine or terrestrial, has scarcely any at all.

This isolation extends even to the sea-fish, to a certain extent. Though the differences between Port Jackson and Port Philip as regards temperature and situation are slight, yet the common marine fishes are of different species. It is a remarkable fact also, that the Geology of the South and East Coasts are different. In the East we have the main cordillera of our continent, which varies but little in its character from Cape Howe to Cape York. We have a central granitic axis with the usual porphyritic and diabasic or dioritic dykes, and cappings. These metamorphic or volcanic rocks are flanked by highly-inclined palæozoic schists and slates, Devonian rocks less inclined, altered, or not fossiliferous appear in places. These are succeeded by the upper and lower coal measures. The whole are capped unconformably by almost horizontal sandstones, known in New South Wales as the Hawkesbury formation. This is the order and character of the range wherever I have visited or crossed it; and this is the sequence shown by all geological surveys. The Hawkesbury sandstone is fully developed in various places, and can be seen in its best sections around the Endeavour River and on the upper waters that flow into the Gulf of Carpentaria. On the Pacific side of the range there are small outlines of the mesozoic rocks in various places north of Cape Moreton. They generally occur on lowlands or where the main axis is less marked as a centre of disturbance. These exceptions are so small that they do not affect the general truth that our cordillera is palæozoic in age, and has been upheaved at the close of the palæozoic period.

On the South Coast the Geology is quite different. There is no main axis. A few isolated ranges crop up in different parts of the coast. These are never of large extent, except in the case of the range which begins at Cape Jarvis. The palæozoic rocks are not absent, but they occupy quite an insignificant position in comparison with the immense development of tertiary formations. The methods applied to the Geological investigation of the Eastern range are quite useless here. In palæontological research, as is well known, fossils of the earlier periods are common to the whole world. In tertiary palæontology it is different. Geographical provinces for molluscan life are as distinct, or nearly as distinct, as they are now. It thus happened that what was done on the East Coast was no help whatever to raise the veil from the Geology of the South Coast, and our southern Geology remained a sealed book until recently. Even now only a few pages have been discovered. It has been my good fortune to be connected a good deal with the development of our Australian Geology. I have thought it might not be unbecoming in me to relate in this address some facts connected with its history. Though they belong to personal experience, they are the property of our scientific history as well, and I do not think I overrate their interest by recording them here. In 1855 I first saw some of the tertiary fossils of South Australia. They were partly a collection from the River Murray, and what I saw daily exposed in the limestone quarries near Government House in Adelaide. No one could tell me much about them. I was referred to the narrative of Sturt's journey down the River Murray in 1830. In those delightful volumes I found two lithographic plates of fossils taken from the River Murray. Beyond this there was no information to be had. An attempt had been made by Captain Sturt to identify some of the fossils with European tertiary remains but the identifications were all incorrect except in the genera. The only beds I had seen were the limestones at the quarries just mentioned. Fossils were plentiful in them, but they have been now nearly all removed. It was some months before I could examine other beds. These were the limestone cliffs at Mount Gambier and Mosquito Plains, where sections continually occur in caves and extinct craters over hundreds of square miles. The whole of the stone exposed is one mass of fossils. I can scarcely describe my surprise when I first came to examine these rocks closely. Shells are not numerous, but the rock for 100 feet or more is made up of minute organisms—bryozoa for the most part, but largely intermixed with foraminifera and brachiopoda. When we consider what numbers of these organisms are required to make up one cubical inch of such stone, the countless hosts in hundreds of square miles is a bewildering thought. In the days when I first examined these strata everything was in keeping with such silent records of geologic time. The cliffs and caves were untouched, except by the hand of time. The country, then called the new country, was scarcely settled upon, and one might travel all day without meeting even a blackfellow. The variegated cliffs were in their original state in those silent forests or plains. In some few places weathering had exposed surfaces like the Dover cliffs, and quite as white and dazzling. For the most part the strata were weathered into rounded steps or terraces, coloured yellow, red, or orange, and dotted over with the bushes and creepers that grew abundantly upon them. Every one who knows the graceful forms assumed by the calcareous bryozoa will understand the world of wonder and beauty that was revealed by a close inspection of the stone. It was easy to gather abundant material for speculation, but I searched in vain for any clue by which I could give them a name.

Palæontology was not then the science it is now. D'Orbigny, Reuss, Hagenow, Michelin, and Busk had hardly given their labours to the world, and their works were not accessible in the Australian Bush. I did not care so much about giving a name to all these remains as to be able to give a place in Geology to the strata which contained them. What age were they ? Tertiary I scarcely doubted, though there was much about them which recalled the chalk or upper cretaceous of Europe. But to what place in the tertiary deposits to assign them I did not kow. I made a large collection of the fossils, and sent them to London, to Sir Charles Lyell, who had from the beginning given me great help in my Geological studies. I had become acquainted with him through Dr. Buckland, Dean of Westminster. I mention both these names, for surely Geology owes more to them than anyone in the history of its progress. They are justly the pride of British Science—Sir Charles Lyell for his brilliant genius in systematising Geology, and the Dean for the way he made the science attractive and popular. My parcel of fossils was not long without an answer. The letter of Sir Charles has an interest which will warrant my giving it in extenso. It ran as follows:

"Your letter preceded the packet of fossils by some six weeks, but they have come to hand safely. I am very much interested in them, and so are all to whom I have shown them, especially Mr. Busk, who is our greatest authority on *Bryozoa*, both living and fossil. I have placed my collection in his hands, and he promises to make them the subject of a paper to be read before the Geological Society. I must leave it to himself to tell you whether they are new or not. With regard to the question you ask as to the age of these Australian beds, I find it very difficult to give you a reply. You are certainly right in regarding them as tertiary, but their position will depend upon their relation to the existing marine fauna in Australia. This is a matter which can only be undertaken by Naturalists in Australia. I am informed that very little is known of the marine zoology of the seas around your continent. Since your fossils arrived I have made inquiry about a good collection of typical Australian marine shells, but without success. Dr. Gray informs me that the best authentic specimens in the British Museum are from the North Coast. Of those said to be from South Australia the localities given are not always to be relied upon. This may seem disheartening to you, but if you will view it rightly it will open a most encouraging field for your inquiries. What I should advise you to do is to make yourself thoroughly acquainted with the marine zoology of South Australia, Without troubling yourself with specific names, collect wherever you can and examine collections of marine objects. Compare them with all the fossil forms you know. By such means you will soon be in a position to tell more of the age of your tertiary beds than the most learned of our Palæontologists in Europe could tell you. You will add in a valuable degree to the store of scientific knowledge, and for a young Geologist I cannot well conceive a more inviting position. I hope to hear more of your labours, and I will be happy to render you any assistance in my power. Since writing the above I have been informed by my friend Mr. Ramsay that there is a geological survey about to be established in Victoria, South Australia *(sic)*, under the direction of Mr. Selwyn, a young Geologist of great promise. Probably you can put yourself in communication with him.—Yours, &c., CHARLES LYELL."

Here then, was a task for Geologists, if ever we were to pronounce positively on the age of our tertiary formations—to ascertain what was the marine life of our South Australian Coast, and so by comparison gradually to comprehend the history of the great tertiary deposits. I trust I shall not intrude too much of detail into this address if I briefly state the manner in which Sir Charles Lyell's advice was followed. I was alone upon the field with no professional aid near, so that for many years South Australian Geology made no progress beyond what an amateur could effect. I had before me an easy path by which to commence inquiry. All round the coast from Cape Northumberland to Cape Jaffa there was a series of raised beaches; for twenty miles inland the soil for sixteen feet or so in depth was one mass of shells. They were quite loosely imbedded in a light shell sand, and were but little changed in appearance, and for the most part retaining their colouring in a faint but easily traceable way. It was not difficult to collect a large number of species, and they were easily compared with the shells of the coast near. I found only one point of difference, and that was that the fossils were generally of larger size in the same species. At that time I concluded that when the fossils had been entombed the climate had been warmer; but now I think differently. Since I have examined the fauna of our tropical shores I find that an increase of temperature affects diversely those species of our southern shores which stray into the northern seas. Some undoubtedly grow larger, such as *Acmæa marmorata;* others are dwarfed and stunted in their growth, such as *Littorina pyramidata;* while others, such as *Acmæa septiformis*, are not affected at all by heat. I do not pretend to solve the problem presented by these shells, but I am quite convinced that our latest pliocene or post-pliocene deposits contain shells of larger size than those which occur on our coasts now. I did not find any species in the deposits which I could not also find on the shores, but the converse of this did not hold good. There were a good many shells on the beach which were not to be found as fossils, though they may, of course, have existed in pliocene times. They were rock species, and we could not expect to find them in these sandy beds.

By these fossils a start was made in classification. Here, at any rate, was one series of deposits that were of latest tertiary age. They were lying conformably on the older limestones with nothing in common with them—not even one shell, as far as I could discover. I may mention here the difficulty I experienced in naming the ordinary mollusca, except as to genera. If this was a difficulty with the recent beds how much more so was it with those of an older origin. Professor Busk named a few of the *Bryozoa*, while Professor Rupert Jones, of the Military College at Sandhurst, rendered me constant assistance. Professor P. Martin Duncan described a good many of the corals. By these aids much information was collected, though I hardly attempted to definitely name any of the horizons. I thought I could leave that and the determination of species to a more advanced state of knowledge than we possessed, and so, in 1863, I published my first work on the Tertiary Geology of Australia. I did not attempt to name any species, which is a matter of regret to me now. I expected aid from European men of Science, which never came. In 1865 Mr. George French Angas published in the 'Proceedings of the Zoological Society of London' a list of the South Australian Marine Mollusca, and described many new species. This did not enumerate half or perhaps a quarter of those living on our coast, but it was a great help. From that day it may be said the work of classifying our rocks was begun in a systematic manner. I refrain from referring in detail to what was effected by the Victorian Geological Survey, or by Professor M'Coy in the Exhibition reports, or my own paper before the Geological Society of London in 1859. Mr. Selwyn, in his report of the Geological Survey of the Cape Otway district, made the first attempt at the classification of the tertiary deposits of Victoria, but the palæontology was not attempted until the publication of the 'Decades,' by Professor M'Coy, some years later. I had described a few species of *Brachiopoda* and *Echini* with some *Pectens* in the Transactions of the Philosophical Society of Adelaide in 1865, but the number of copies printed was so small that they were scarcely known out of the Colony, and many of my species were redescribed by foreign authors. Dealing with the *Echini* was especially difficult. The whole class was in much confusion until the 'Revision' of Agassiz appeared, and even then our Australian species were not known. In 1866 I published for the Government of South Australia an essay on the classification of the whole tertiary deposits. My idea of the age of the beds was founded less upon palæontological considerations than upon the position of the beds with reference to more recent deposits. In some respects my suggestions have not been generally accepted, and now that I am in possession of better evidence I am not inclined to insist on them. In 1870 Professor P. Martin Ducan undertook to review the whole question of the age of our tertiary beds. His essay appeared in the journal of the Geological Society, and was of a most finished and elaborate character. His knowledge of the position of the beds was derived from Mr. Selwyn's reports, but, as is usual with those not familiar with the country, he confused many widely separated formations, and made no geographical distinction between Mount Gambier, in South Australia, and Hamilton, in Victoria, places more than 100 miles apart, whose formations are widely distinct in every respect. In an ingenious manner he made some generalisations drawn from comparison between the fossil corals and what he believed to be the coral fauna of Australia. For the latter he had nothing to depend upon but the very doubtful habitats in the work of Edwards and Haime. It was not to be expected that such conclusions would be of any value. Professor Duncan subsequently made a review of the tertiary fossil *Echini* of Australia, comparing them with existing forms on our coasts. In both these essays it was abundantly evident that any conclusions must be imperfect without a better knowledge of our living fauna. The difficulty which I had experienced in the beginning was still the obstacle. It seemed very clear that the problem would never be solved unless the line of inquiry indicated by Sir Charles Lyell were followed. In 1877 I tried to aid this by a complete census of the marine mollusca of Tasmania, in which Colony I had named and described a very large number of tertiary fossils occurring in a small patch of tertiary age on the north coast of that island. But whatever individual effort may have done, I think we owe more to the Linnæan Society within the last few years than to all that has been previously effected. Since its establishment we have seen what I must be excused for calling immense strides made in the knowledge of the marine zoology of our coasts. We have now very complete information on our Mollusca and Crustacea, our Fishes, Corals, Urchins, and Bryozoa. If the problem of the age of our tertiary beds were to be dealt with now, general conclusions could be formed which subsequent discoveries will not disturb to any great extent. Such an attempt has been made by Professor Tate, of Adelaide, as well as in essays of my own in the Transactions of the Royal Societies of Tasmania and New South Wales. Professor P. Martin Duncan in his essay deprecates the use of such terms as Pliocene, Miocene, and Eocene by Australian Geologists, and prefers the terms Upper, Middle, and Lower Cainozoic, as tending less to mislead in our present imperfect knowledge. If I understand the objection, it refers to the danger of error from supposing that what we call Pliocene or Miocene was coeval or contemporaneous with formations in Europe bearing the same name.

Professor Tate has well pointed out that the terms suggested by Professor Duncan mean neither more or less than the terms used in Europe, and there is just as much implied by their employment. In this brief sketch of the history of Australian Tertiary Palæontology I have shown, I think, how much the Science has been retarded for want of such researches as our Linnæan Society is specially instituted to encourage. I may add that the progress in every department of Natural Science in Australia has been surprising since its influence has been felt. It has not only stimulated observation, but has given that kind of encouragement to systematic and technical records which has made the only real progress that can be made in Australian Natural History.

I should like, in concluding this address, to give a glance at the progress of Natural Science during the past year, after having dealt with the Australian history of our department of Science. But even a glance at one year's work is more than space will permit me to give. It will, however, be in keeping with the matter of this address if I refer to the researches of Mr. Sorby on the metamorphism of calcareous rocks. His observations were made public in his presidental address last year to the Geological Society of London. They have a most important bearing on our Australian tertiary rocks, but to make this clear I must state some further facts relating to them. In my first acquaintance with the Mount Gambier limestones I noticed that some shells were found only as casts — these by far the majority. A few *Pectens* and *Brachiopoda* were preserved with the shelly matter unchanged. Corals, except the *Oculinaceæ*, were preserved as casts only, while the *Echini* were always crystallised into calcite, and so were their spines. Those peculiarities were only seen in the Mount Gambier limestone; but however far apart the localities where the deposits were represented they never varied in character. The formation is very extensively spread over thousands of square miles of country, from the River Murray to Gippsland, but it does not always crop out on the surface. It is covered by a formation in which all the shells are well preserved, and where such things as casts are unknown. I do not propose to dwell on the strong contrasts these deposits present, but merely draw attention to the fact that in the lower Bryozoan limestones the majority of the shells and corals are always found as casts, and a few have the shelly matter unchanged. I was astonished at finding that the rule held good in the same formation in as remote a locality as the Middle Island of New Zealand (Oamaru). It appears that the same phenomenon is occasionally seen in Europe and there the same shells (*Pectens*, *Brachiopoda*, &c.) resist the solvent, and are found entire. I must refer my readers to the address of Mr. Sorby for a full account of this most singular case of metamorphism, and for the details of the ingenious and and brilliant researches which have led to its explanation. The results are briefly these : Mr. Sorby has found, by careful analysis that much of the carbonate of lime in Shells, Corals, *Bryozoa*, *Echini*, &c., is present in a mineral or crystalline state, and not merely organically combined. There are, I need hardly say, two well defined forms for the crystals of carbonate of lime—one calcite, and another arragonite. It is in the latter form that the mineral is found for the most part in shells, &c., the exceptions being few. But arragonite is a very unstable form of the combination of carbonic acid and lime, and thus it is easily decomposed, and dissolves away or changes into calcite. The latter mineral is a very stable form, and though the pseudomorphs of calcite in arragonite casts are numerous, the contrary never happens, that is to say, arragonite is never formed at the expense of calcite crystals. Furthermore, Mr. Sorby has found that Shells, Corals, &c., which invariably occur as casts, are those in which the carbonate of lime exists in the form of arragonite or the unstable compound, while the permanent shells and corals such as *Pectens*, *Bryozoa*, *Oculinaceæ*, &c., are the forms in which the carbonate of lime originally exists in the form of calcite. The reason for this distinction is still veiled to us, and I suppose will be found to depend on the explanation, which we have still to discover, of the allotropism of the carbonate of lime. I may mention that the metamorphism to which I refer seems to depend on the extent to which the beds are calcareous. In the Murrayian deposits (to use the appropriate distinctive term of Professor Tate) or Middle Miocene, as they are represented at Muddy Creek, Western Victoria, there is no metamorphism, but the beds, though very calcareous, are largely mixed with the siliceous and ferruginous remains of submarine volcanic rocks.

In conclusion, I may congratulate the members on the extensive and untouched fields of investigation which are open to us in this country. It is hard to turn into any path of Science without being met half-way, as it were, with new and important discoveries. A few days ago at Cleveland, in Moreton Bay, I came across a basaltic bed, which had been partly cut away for road purposes. Underneath I found a bed of shells, all of existing species, and such as inhabit Moreton Bay at present. Here was direct evidence of the age of our modern dolerites of the East Coast. They are Post-Pliocene, and this was the first clue to their age from marine fossils which have been found on the seaboard on this side of the Continent. I think it will show hereafter that our so-called Pliocene fossil fruits are of an earlier date, since we cannot suppose the change to have been so complete in the vegetable kingdom, and none to have taken place in the marine fauna, and that probably our dolerites of the interior are of Miocene age. I intend to treat the subject more at length. I merely indicate it now to show how easily we may add in an important manner to the facts of Science in Australia. I must again congratulate my fellow workers in this Society on their industry and zeal. They have laboured so indefatigably that I can look back to the period of my presidency as one which has largely added to the reputation for usefulness and efficiency which the Linnæan Society has gained."

A very cordial vote of thanks was accorded to the Rev. J. E. Tenison-Woods for his very instructive and interesting address. The Treasurer's statement showed:—Balance from 1879 and receipts, £335 1s. 1d.; expenditure, £291 11s. 4d.; balance at credit, £43 9s. 9d.

The Rules were amended, on the motion of the Hon. W. Macleay, increasing the number of the Hon. Secretaries to two and the Members of Council to eight.

The following gentlemen were then elected the Office Bearers and Council for the year 1881.

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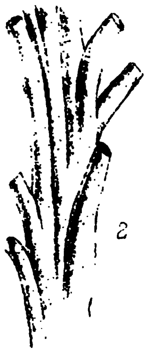

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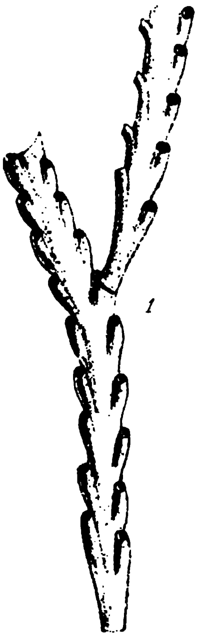

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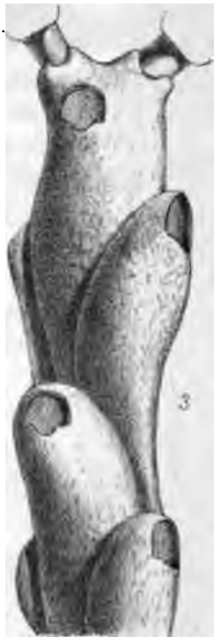

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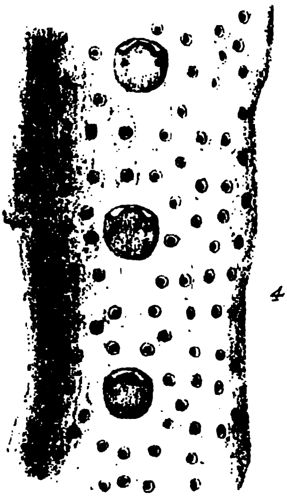

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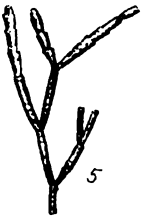

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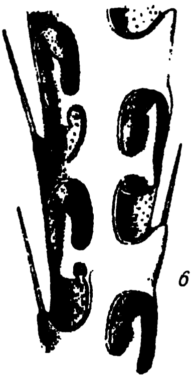

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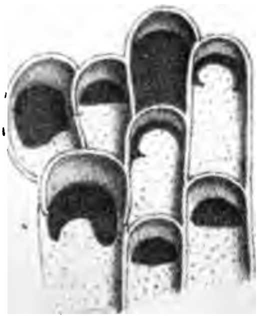

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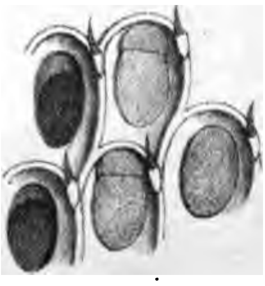

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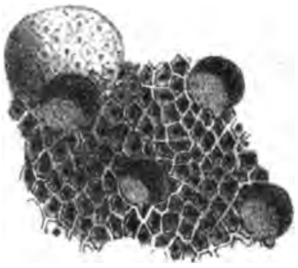

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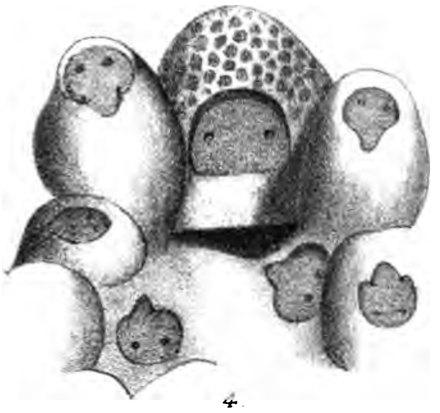

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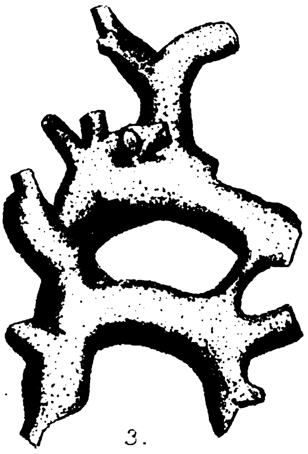

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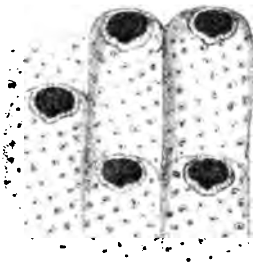

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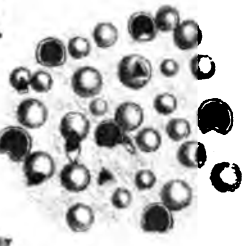

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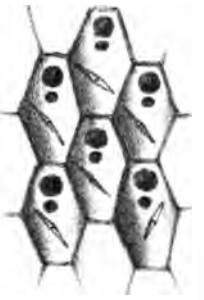

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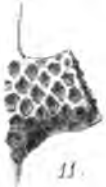

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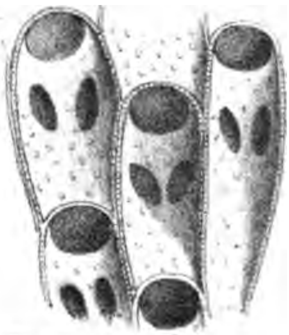

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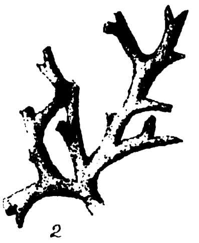

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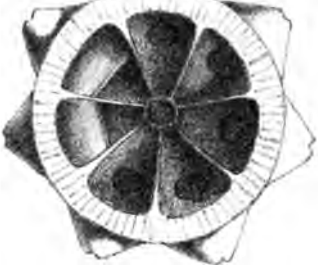

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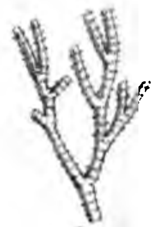

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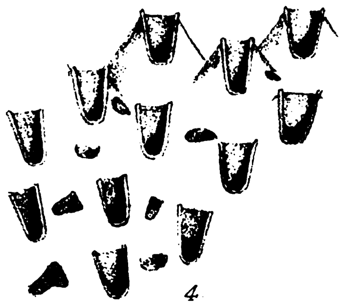

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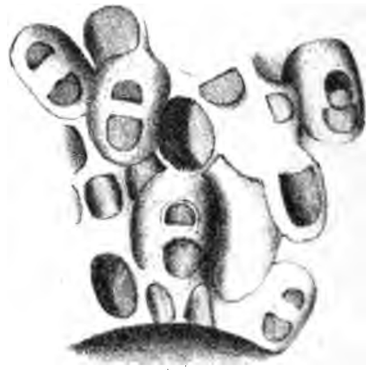

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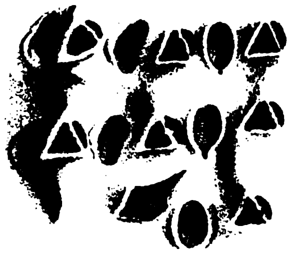

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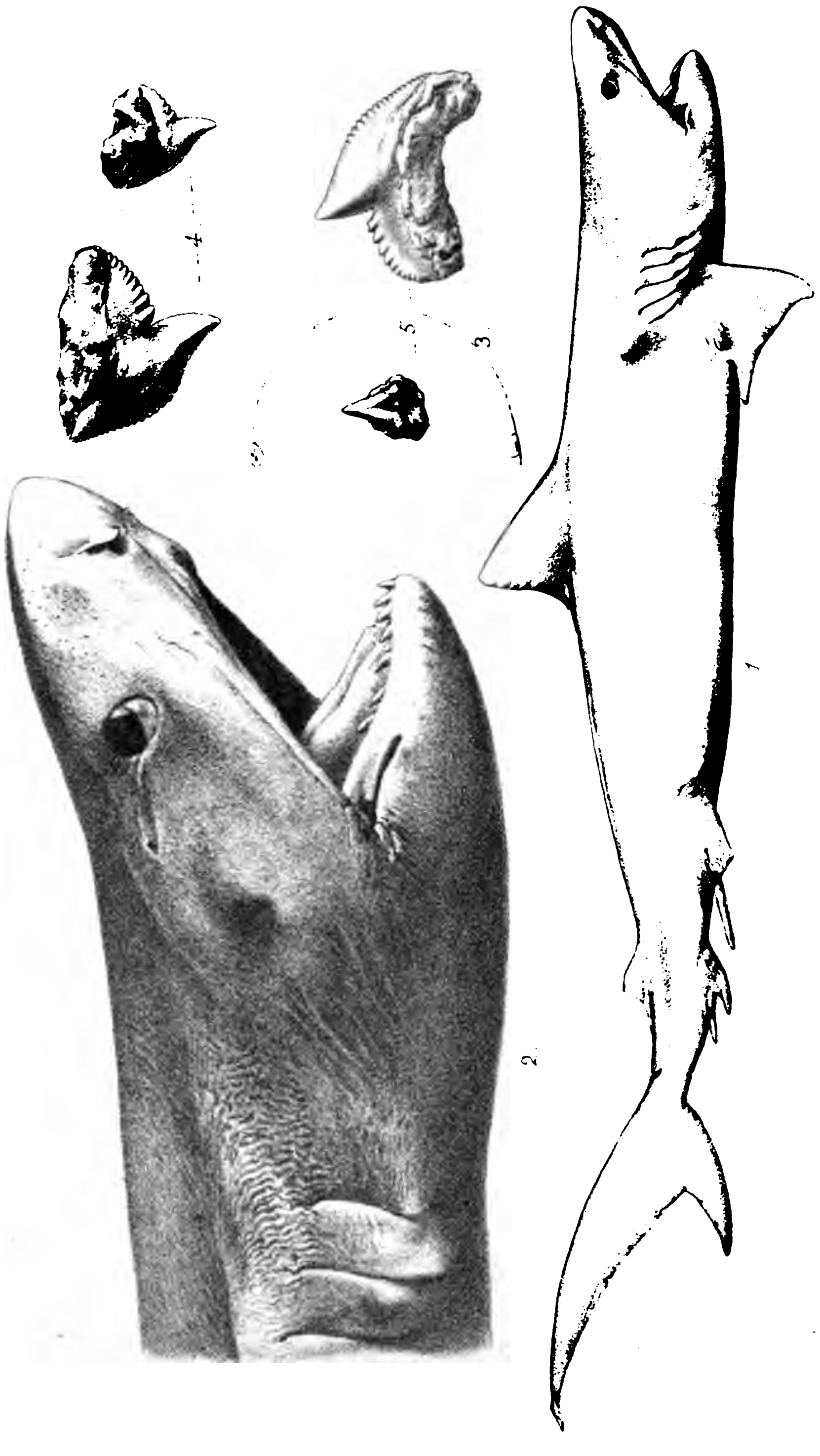

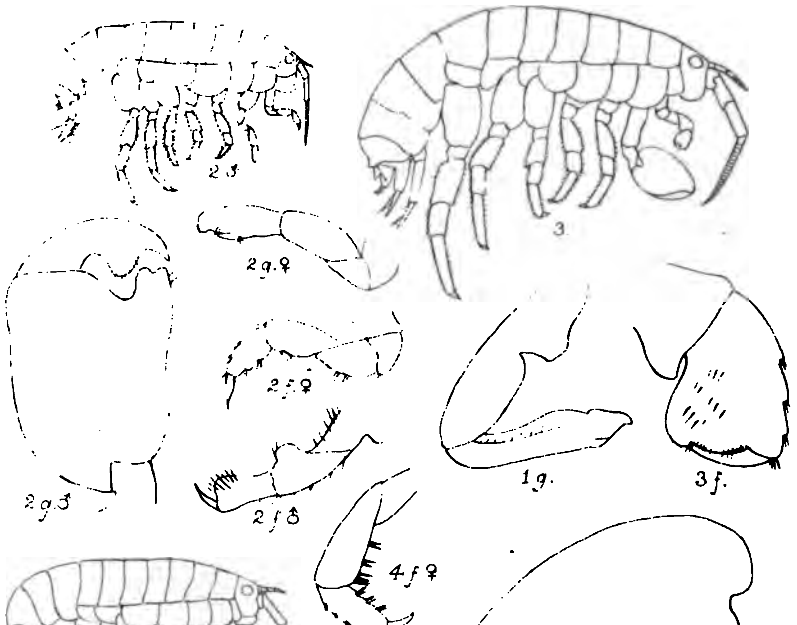

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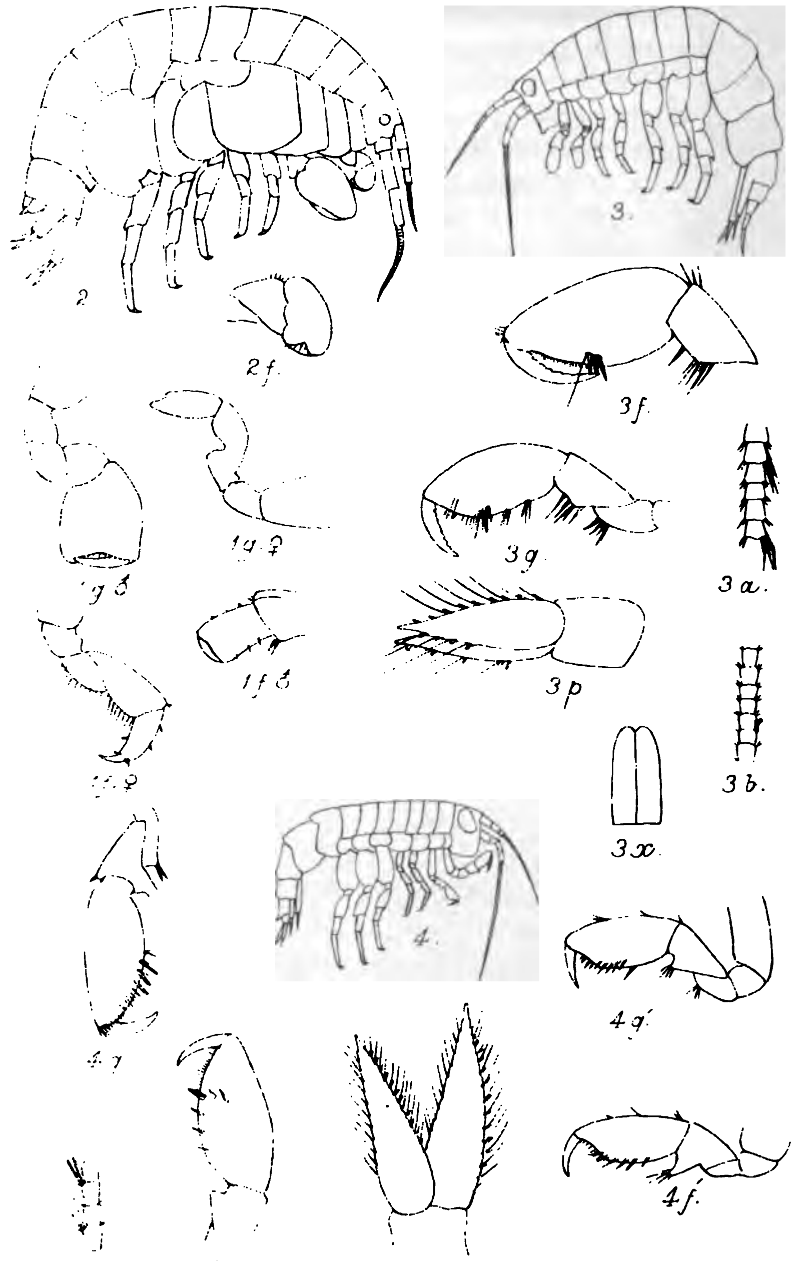

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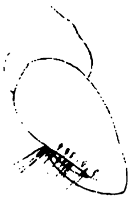

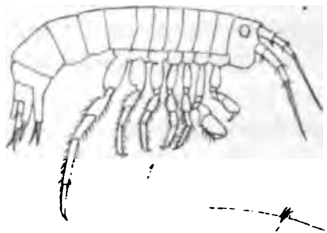

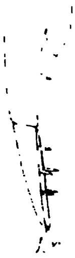

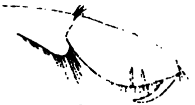

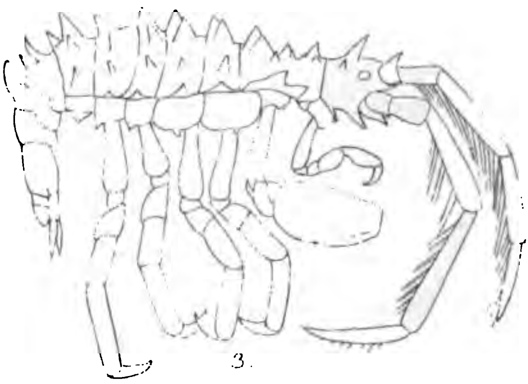

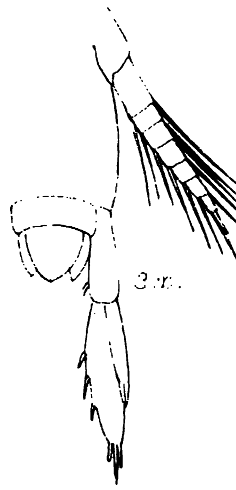

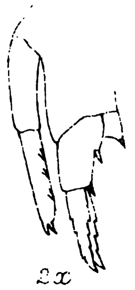

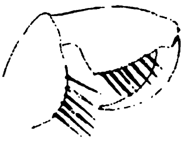

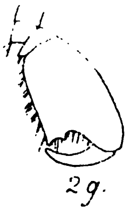

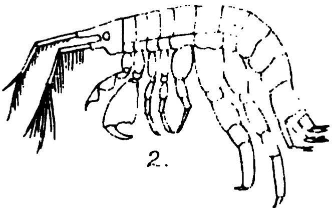

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PL 8.

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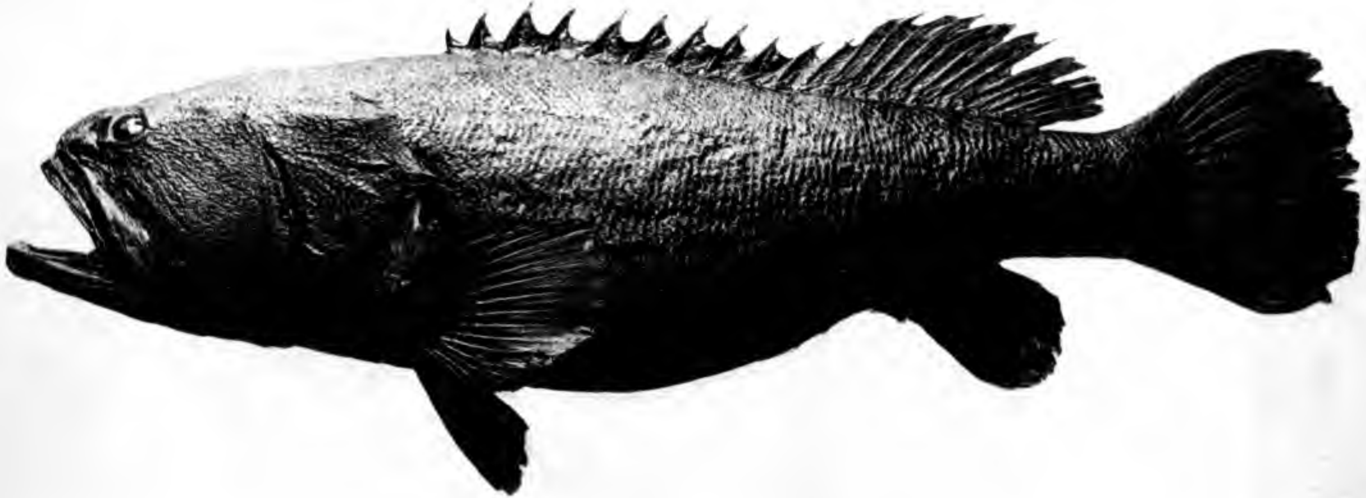
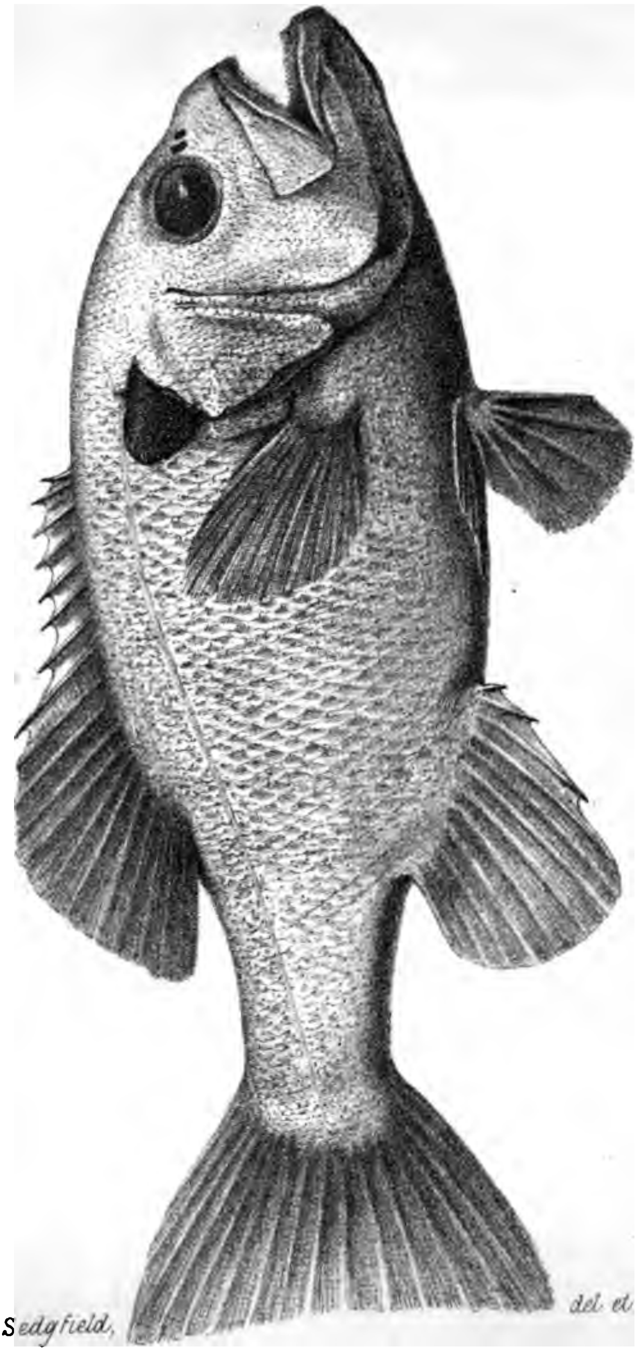
P. L. S., N. S. W. Vol. V pl. IX



HART & ROUX, NEWTOWN, SYDNEY.

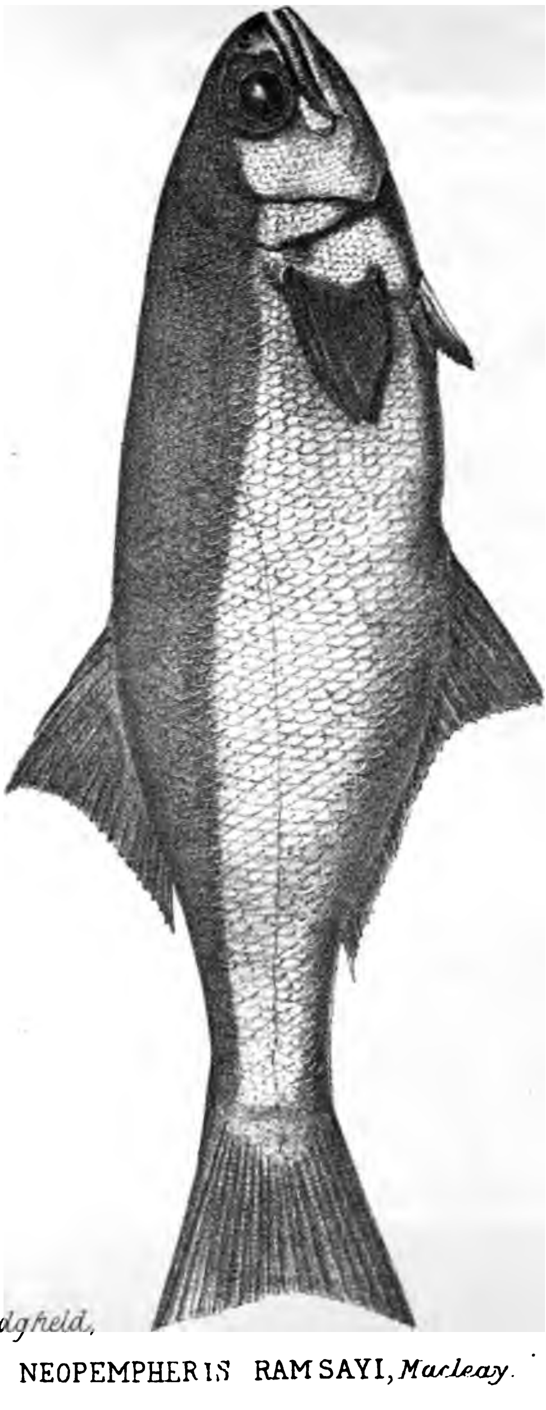
OLIGORUS TERRÆ REGINÆ RAMSAY

Plates X. and XI. of this Volume are omitted, the Paper which they were designed to illustrate having been lost.



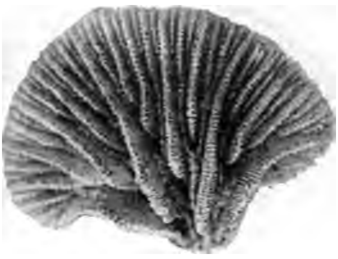
S Sedgfield, del. et lith.

GLAUCOSOMA SCAPULARE, *Ramsay.*



S. Sedgfield, del. et lith.

NEOPEMPHERIS RAMSAYI, *Macleay.*



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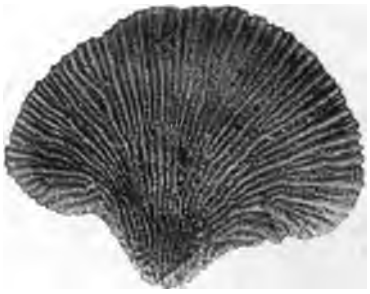

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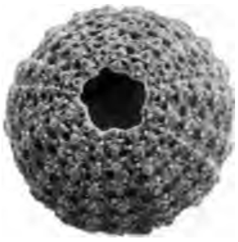

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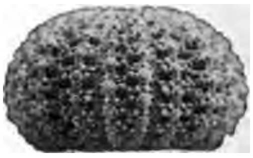
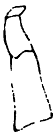


4.

1. *Diaseris Mortoni (Tenison Wood), magnified.*
2. *Ditto, Base a costa.*
3. *Temnoplerus cavernosa (Tenison Woods),* 4. *Diani.*
4. *Ditto, side view.*

P. L. 8. Vol. 5.

Pl. 16.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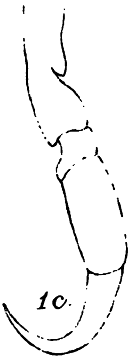
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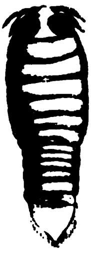
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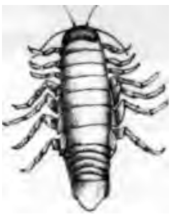
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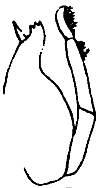
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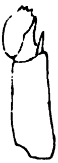
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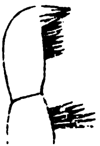
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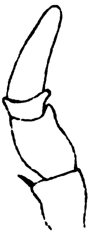
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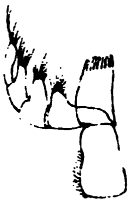
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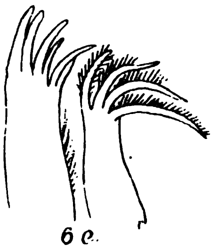
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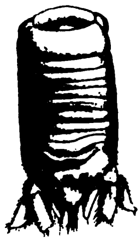
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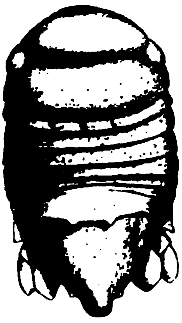
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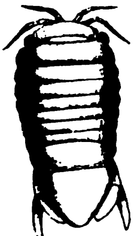
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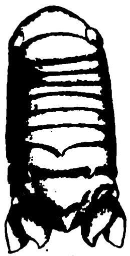
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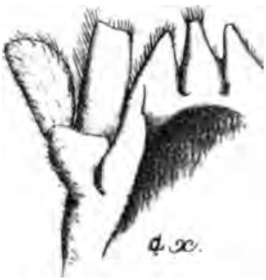
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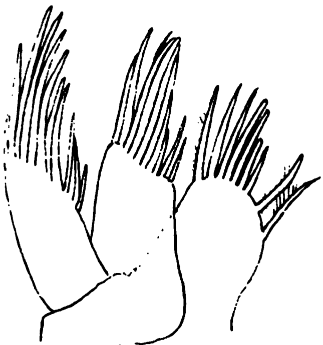
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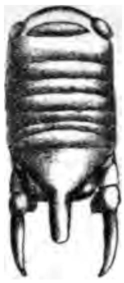
S. Sedgfield lith.

W. A. H. del.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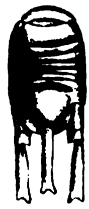
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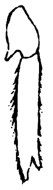
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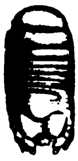
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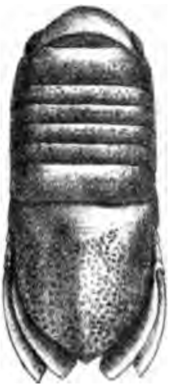
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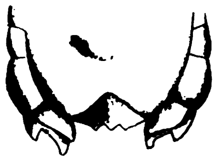
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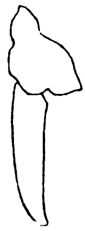
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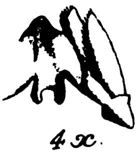
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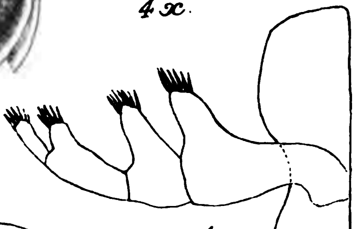
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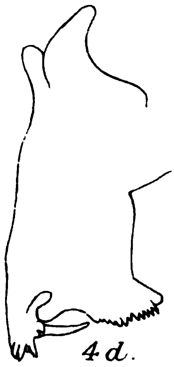
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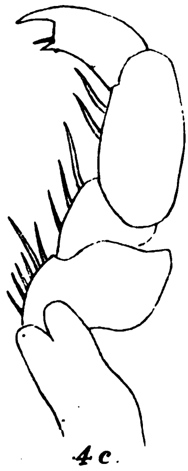
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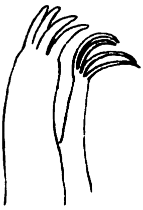
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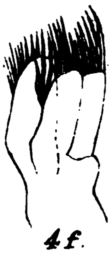
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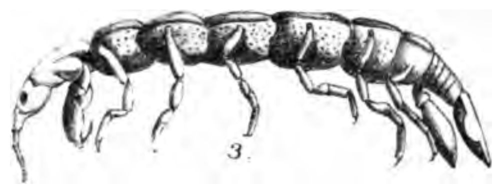
W. A. H. del. S. Sedgfield lith.

P. L. S. Vol. 5.

Pl. 18.



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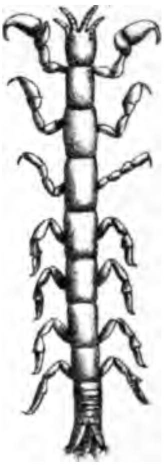

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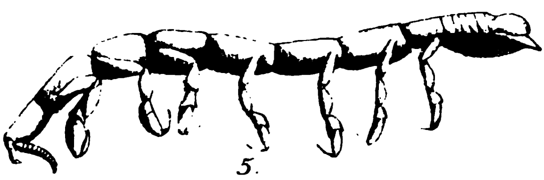

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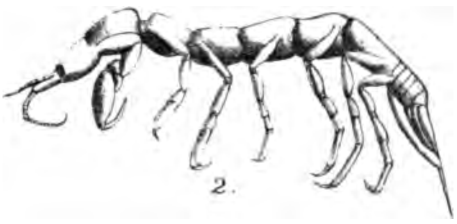
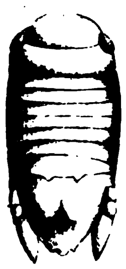


2.

4 b.

4 a.



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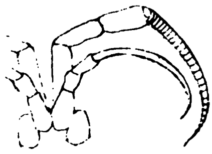


2 a.

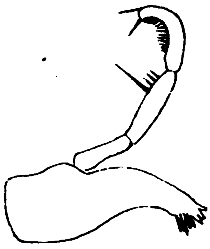
2 c.

1x.

2 x.

W.A.H. del.

S. Sedgfield lith.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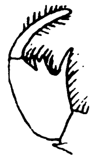
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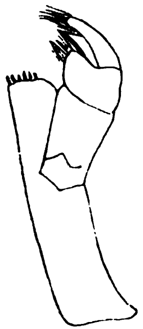
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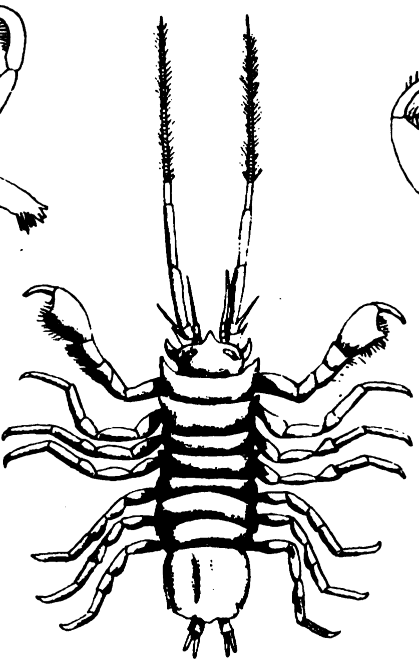
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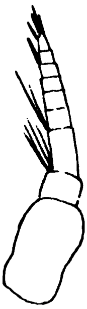
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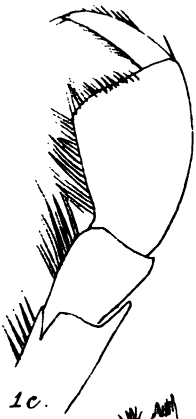
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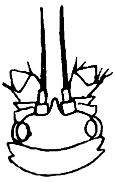
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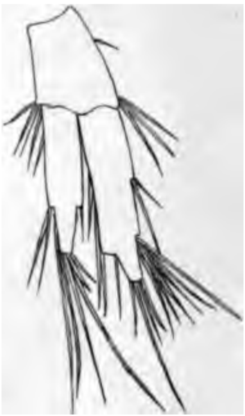
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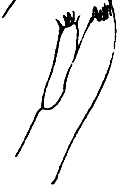
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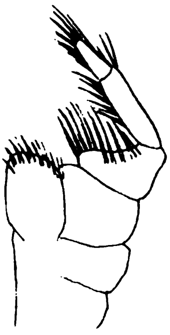
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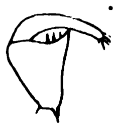
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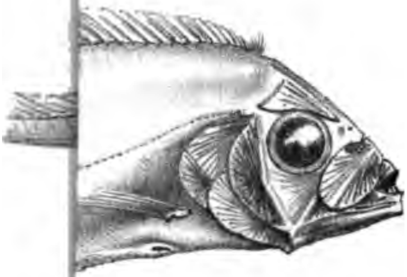
W.A.H. del. S. Sedgfield lith.



S. Sedgfield del et lith.